

17.

The Amphipoda of the Bermuda Oceanographic Expeditions, 1929-1931.¹

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U. S. National Museum

(Text-figures 1-48).

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INTRODUCTION.

This collection of Amphipoda from Bermuda was obtained on the Bermuda Oceanographic Expeditions of the Department of Tropical Research of the New York Zoological Society. The Expeditions concerned were under the direction of Dr. William Beebe, and were Numbers 23, 24 and 25 of the Department, in the years 1929, 1930 and 1931. They were organized for the purpose of making an intensive survey of a limited area of the deep subtropical ocean. The area chosen was roughly circular, eight miles in diameter, with its center at 32° 12' north latitude and 64° 36' west longitude, a point about nine miles southeast of Nonsuch Island, Bermuda. The total depth of water in this area increases from 1,000 fathoms at the inner rim of the circle to nearly 1,500 fathoms at the outer edge. All nets, trawls and deep-sea dives were made within this circular area of the open sea. During the three years when the present collection was made, 1,350 nets were drawn, from the surface to 1,200 fathoms.²

The collection of Amphipoda treated in the present paper is the most extensive which has come from the western North Atlantic. It consists entirely of pelagic or bathypelagic species, the greater part of which, as in every extensive collection, are well known. Rare forms are present, however, some of which have been recorded only once before, and a few are new to science.

The Gammaridea are represented by 20 genera comprising 22 species. The Hyperidea are represented by 41 genera comprising 76 species and 4 varieties. One genus, 3 species, and 2 varieties are here described as new.

The measurements given are from the front of the head to end of the farthest reaching urosome appendage. Stebbing's system of designating the peraeopods in "Das Tierreich, Amphipoda," is here used; viz., gnathopods 1 and 2 and peraeopods 1 to 5.

SYSTEMATIC ACCOUNT.

ORDER AMPHIPODA.

Suborder 1. Gammaridea.

FAMILY LYSIANASSIDAE.

Koroga megalops Holmes.

Koroga megalops Holmes, 1908, p. 503, fig. 13.

A single specimen was taken at a depth of 800 fathoms.

Distribution.—This species was described by S. J. Holmes from a single female taken at *Albatross* Station 4257, vicinity of Funter

Bay, Lynn Canal, Alaska. In 1904 the *Thor* took a single immature female at Station 183, (61°30' N., 17°08' W., south of Iceland, Stephensen). In 1928 a single female was taken off the southwest coast of Greenland by the Godthaab Expedition (Stephensen). In 1937 Barnard recorded an immature female from the southern Arabian Sea. Elsa D. Thorsteinson recorded two mature females and several small specimens from the Gulf of Alaska in 1941.

Holmes's and Thorsteinson's specimens each measured 10 mm. Barnard's measured 7.5 mm. The Bermuda specimen is a mature female, about 8 mm. in length, carrying seven large eggs. The male of this species has not yet been recorded.

Scopelocheirus coecus Holmes.

Scopelocheirus coecus Holmes, 1908, p. 500, figs. 10-12.

A single specimen was taken at a depth of 800 fathoms.

Distribution.—This species was described from a single female by S. J. Holmes in 1908 from *Albatross* Station 4405, off San Clemente Island, California, 654-704 fathoms. I have found among the unidentified material in the U. S. National Museum collection another specimen taken by the *Albatross* at Station 4793, off Kamchatka, 54°48' N., 164°54' E., 300 fathoms. There are also in the National Museum four somewhat mutilated specimens taken from a duck stomach at Pacific City, Oregon, in 1931, by the U. S. Biological Survey. The present record from Bermuda is the first from the Atlantic.

Holmes's specimen measured 20 mm. The Bermuda specimen, which I believe to be a female, measures about 17 mm. and agrees very well with the type. The second gnathopod in this species is subchelate, whereas in the other two species of *Scopelocheirus* it is slightly chelate. Holmes, in his figure, shows the first and second urosome segments coalesced, though he does not refer to it in his text. All the specimens show these segments entirely free and movable. The first urosome segment in the present specimen is indented, though not as much as Sars shows for either *S. crenatus* or *S. hopei* (1895, pl. 19). All the specimens which I have examined have this indentation, so it appears that the urosome of this species has not been quite correctly represented by Holmes as far as these two characters are concerned.

Eurythenes gryllus (Lichtenstein).

Gammarus gryllus 1822 (H. Lichtenstein in:) Mandt, *Observ. Groenl.*, p. 34.

Eurythenes gryllus Smith, 1884, p. 54.

Euryporeia gryllus Sars, 1891, p. 86, pl. 30.

Katius obesus Chevreux, 1905d., p. 1, figs. 1-3.

² For detailed accounts of localities, nets and methods of collecting see Bermuda Oceanographic Expeditions, 1929 and 1930; William Beebe, *Zoologica*, Vol. XIII, 1931, No. 1, pp. 1-14; Individual Nets and Data, No. 2, pp. 15-36. No. 3, pp. 37-45.

Forty-four specimens were taken at depths between 500 and 1,000 fathoms.

Distribution.—Spitzbergen; Greenland; North Atlantic; South Atlantic (45° South, Barnard); North Pacific (Gulf of Alaska, Shoemaker); South Pacific (Kermadec Islands, Chilton); Indian Ocean (Arabian Sea, Barnard). The species is new to the Bermuda Islands.

Dr. K. Stephenson (1933, pp. 12-20), who has made a study of *Eurythenes gryllus* and *Katius obesus*, has shown that they are the two sexes of the same species, the former being the female and the latter the male. Chilton (1911, p. 564) says, "It is celebrated as being one of the largest of the Amphipoda, the length sometimes being as much as 90 mm." In the U. S. National Museum collection there is a female taken by the steamer *Albatross* at Station 2097, off Chesapeake Bay, which measures 95 mm. from the front of the head to the end of the uropods. There are also three somewhat smaller females taken by the *Albatross* at Station 3342, off Queen Charlotte Islands, B. C. The *Albatross* took a male at Station 2571 (40°09'30" N., 67°09'00" W.), which is about 8° north of Bermuda. The specimens of the present collection are all males, the largest of which measures about 37 mm.

Eurythenes gryllus was recorded as having been taken at Point Barrow and Point Franklin by the International Polar Expedition to Point Barrow, Alaska, 1881-1885. I have examined these specimens, which are in the National Museum collection, and I find that they are all *Anonyx nugax* (Phipps).

Cyphocaris anonyx Boeck.

Text-fig. 1 a, b.

Cyphocaris anonyx (Lütken in MS.) Boeck, 1871, p. 104.

Cyphocaris anonyx Boeck, 1872, p. 141, pl. 6, fig. 1.

Cyphocaris micronyx Stebbing, 1888, p. 656, pl. 16.

Cyphocaris anonyx Schellenberg, 1926 b, p. 210, figs. 2b, 5a-b, pl. 5, fig. 2.

Twenty-six specimens were taken at depths between 600 and 1,000 fathoms.

Distribution.—North and South Atlantic; North and South Pacific; East Indies; Indian Ocean. There are in the National Museum specimens taken by the U. S. Fish Commission off the east coast of the United States (40° N., 70° W.), and a specimen taken off Lower California (28°23' N., 126°57' W.). It has not heretofore been recorded from the Bermuda region.

Stebbing (1906, p. 29) says, "Peraeopods 1 and 2 subchelate, the sixth joint being distally widened and having a palm margin set with teeth and spines, finger powerful, curved, acute." There appears to be con-

siderable variation in this character. Boeck's figures (1872, pl. 6, fig. 1 l-m) show no trace of a palm with teeth and spines, while Stebbing (1888, pl. 16, *C. micronyx*) shows a well developed palm with teeth and spines. All degrees of variation between these extremes occur. The Bermuda specimens show this character in an intermediate stage as I have figured. This species reaches a length of about 12 mm.

Cyphocaris challengeri Stebbing.

Text-fig. 1 c.

Cyphocaris challengeri Stebbing, 1888, p. 661, pl. 17.

Cyphocaris alicei Chevreux, 1905b, p. 1, figs. 1-2.

Cyphocaris challengeri Schellenberg, 1926 b, p. 212, figs. 6-10; pl. 5, fig. 3.

Cyphocaris kincaidi Thorsteinson, 1941, p. 58, pl. 3, figs. 25-30.

Fifteen specimens were taken at depths between 200 and 900 fathoms.

Distribution.—North and South Atlantic; North and South Pacific; Indian Ocean.

In the North Pacific this species extends into the Gulf of Alaska (*C. kincaidi*). On February 3, 1914, the steamer *Bache* took a specimen of *C. challengeri* in latitude 32°26' N., and 69°21' W., which is only about 4° west of Bermuda, but the present records are the first for the immediate vicinity of the islands. It has also been taken by the steamer *Albatross* on the west coast of Florida.

The characters of this species vary considerably with age. Stebbing's description was taken from a young specimen measuring about one-fifth of an inch in the bent position. In his specimen the second joint of the third peraeopod bore seven teeth on the hind margin. As the animal increases in size this second joint becomes relatively longer and the teeth are gradually lost (Text-fig. 1c). The shape of the first mesosome segment is also subject to considerable variation, as Schellenberg has shown (1926, p. 213, fig. 6). This species reaches a length of 14 mm.

Cyphocaris richardi Chevreux.

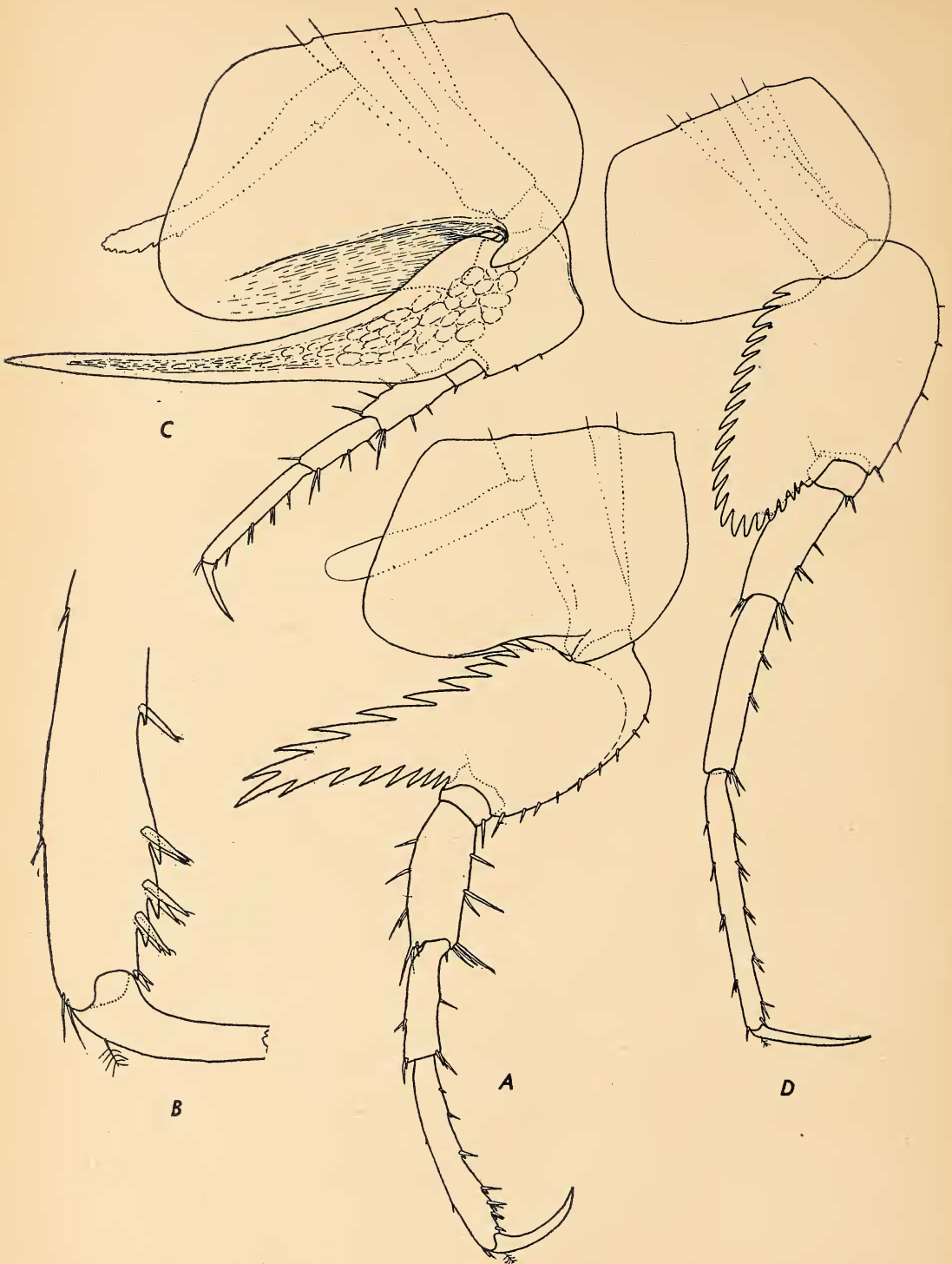
Text-fig. 1 d.

Cyphocaris richardi Chevreux, 1905a, p. 1, figs. 1, 2a-g.

Cyphocaris richardi Schellenberg, 1926a, p. 245, fig. 4.

Two specimens were taken, one at 900 fathoms, the other at 1,000 fathoms.

Distribution.—North Atlantic (56°56' N., 51°17' W., Stephenson, 1933); South Atlantic (62°27' S., 58°11' W., Barnard, 1932); South Pacific (taken by the *Albatross* between 4°43' S. and 14°28' S., off the coast of Ecuador and Peru, Schellenberg, 1929).



TEXT-FIG. 1. *Cyphocaris anonyx* Boeck, female. **A**, peraeopod 3; **B**, end of peraeopod 3 greatly enlarged. *Cyphocaris challengerii* Stebbing, female, **C**, peraeopod 3. *Cyphocaris richardi* Chevreux, female, **D**, peraeopod 3.

Chilton recorded it as *C. anonyx* from 71°50' S., 23°30' W.). The present records are the first from the Bermuda region, but a specimen was taken by the *Albatross* off Marthas Vineyard (40°02'49" N., 68°49'00" W.).

The largest specimens of this species are those recorded by Barnard (1932, p. 35) from the South Shetland Islands; a female 38 mm. and a male 40 mm. in length. The usual length is from 10-20 mm. The Bermuda specimens are about 10 mm.

***Paracyphocaris praedator* Chevreux.**

Text-fig. 2.

Paracyphocaris praedator Chevreux, 1905c, p. 1, figs. 1-3.

Four specimens were taken at depths between 500 and 1,000 fathoms.

Distribution.—This rare species has been taken only in the North Atlantic at the following localities: 46°15' N., 7°09' W., 36°46' N., 26°41' W., 38°02' N., 10°44' W. (Chevreux); South of Iceland (62°10'08" N., 19°36'00" W. (Stephensen); 3°10' N., 5°28' E. (Schellenberg); 6°19' N., 56°00' W. (Stephensen).

Up to the present time only six specimens of this species have been recorded and, as Stephensen has already remarked, they have all been males or immature, the sex of which could not be determined. Of the four Bermuda specimens, the largest, a fully matured male possessing sexual organs, measures 15 mm. The other three specimens, measuring about 10 mm., are immature and the sex cannot be determined.

In the mature male the mesosome is very broad, with the ventral surface greatly distended and filled with a dark reddish substance giving the animal much the appearance of some of the lanceolids. The mesosome narrows gradually to the normal metasome.

The first antenna of this large male is not slender, as figured by Chevreux (1905, p. 3, fig. 2a), but is much thickened. The first joint of the flagellum is nearly as thick as, and a little longer than, the second and third peduncular joints combined, the following five or six flagellar joints tapering off to normal slender proportions. In the immature specimens the first antenna is as figured by Chevreux.

***Metacyphocaris helgae* Tattersall.**

Metacyphocaris helgae Tattersall, 1906, p. 29, pl. 3, fig. 1.

Metacyphocaris helgae Schellenberg, 1926b, p. 216, figs. 26c, 27.

Thirty-three specimens were taken at depths between 600 and 1,000 fathoms.

Distribution.—This species was described from off the coast of Ireland. It has since been recorded from the west coast of Greenland (64° N.), off Southern Greenland and

south of Iceland (Stephensen); off Madeira Islands (Pirlot); Gulf of Guinea (Schellenberg); South Atlantic (35° S., 19° W., Barnard); Indian Ocean (Schellenberg); North Pacific (Gulf of Alaska, Thorsteinson); South Pacific (*Albatross* Station 4711, 7° S., 94° W., Schellenberg).

The present records are the first for the Bermuda area.

Barnard recorded a female measuring 17 mm. with brood pouch, from the mid-Atlantic. In the Bermuda material is an immature female measuring about 15 mm. This specimen has partially developed marsupial plates, and the ventral surface is distended as I have described for the mature male of *Paracyphocaris praedator*, which Barnard thinks may be indicative of a bloodsucking habit. The mandible has a 2-jointed rudimentary palp as noted by Barnard (1932, p. 37, fig. 5).

***Crybelocephalus megalurus* Tattersall.**

Text-fig. 3.

Crybelocephalus megalurus Tattersall, 1906, p. 33, pl. 3, fig. 1, pl. 5, figs. 1-4.

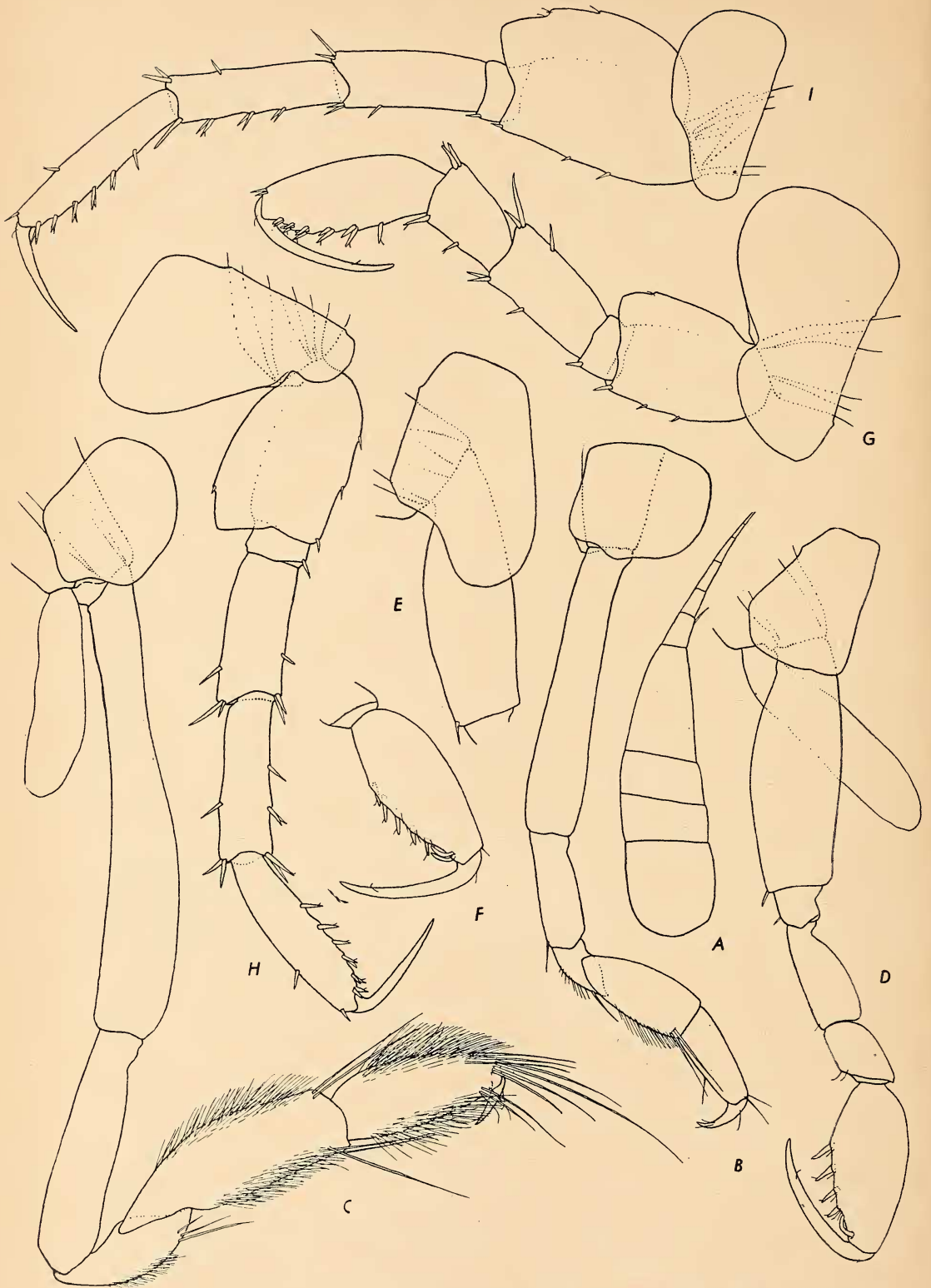
Five specimens were taken at depths of 600 and 900 fathoms.

Distribution.—Described from off the southwest of Ireland; the *Thor* took a specimen at 61°30' N., 17°08' W., and one at 49°27' N., 13°33' W. (Stephensen); a specimen was taken by the scientific expeditions of the Prince of Monaco at Station 3448 in the North Atlantic (Chevreux); the Godthaab Expedition, 1928, took a single specimen, 63°19' W., 26°50' W. (Stephensen).

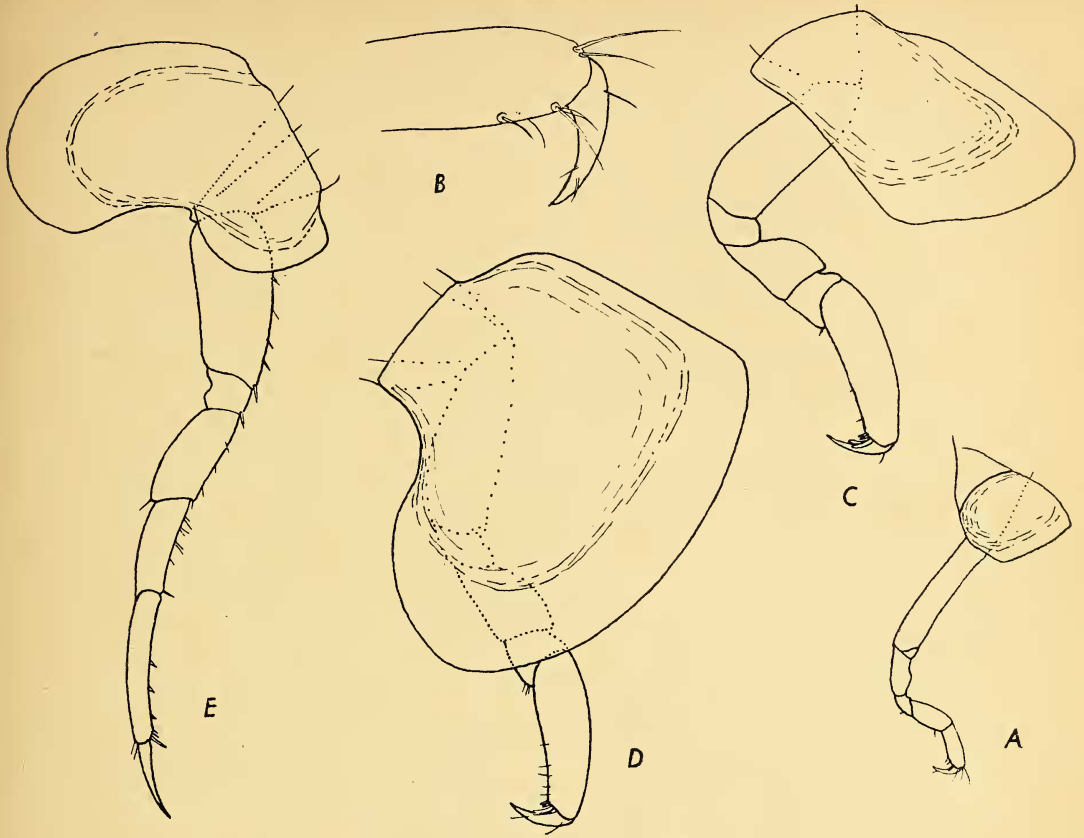
Tattersall says that the two specimens which he studied, measuring 11 mm., appeared to be males, but he does not state his reasons for so believing. The sex of all other recorded specimens has not been mentioned. The Bermuda specimens, the largest of which measures about 11 mm., do not show any sexual characters. They show neither male sexual organs nor marsupial plates. I am of the belief that Tattersall's specimens, and all other recorded specimens, were in a similar condition, and that the absence of marsupial plates led him to believe that his specimens were probably males.

***Crybelocyphocaris*, new genus.**

Head very short from front to back and very long from top to bottom. Antenna 1 without accessory flagellum. Mandible with degenerate 3-jointed palp, and without molar. Maxillipeds with inner and outer plates well developed, and possessing a 4-jointed palp. Gnathopod 1 simple. Gnathopod 2 normal. First, second, and third pereopods stoutly built, sixth joint strongly spinose, dactyl strong and curved and closing against the spinose surface of the sixth joint. Fourth and fifth pereopods normal, longer than



TEXT-FIG. 2. *Paracyphocaris praedator* Chevreux, male. **A**, antenna 1; **B**, gnathopod 1; **C**, gnathopod 2; **D**, peraeopod 1; **E**, peraeopod 2; **F**, sixth and seventh joints of peraeopod 2; **G**, peraeopod 3; **H**, peraeopod 4; **I**, peraeopod 5.



TEXT-FIG. 3. *Crybelocephalus megalurus* Tattersall. A, gnathopod 1; B, end of gnathopod 1; C, peraeopod 1; D, peraeopod 2; E, peraeopod 3.

the first three. Urosome segments long, second and third coalesced. First and second uropods normal. Uropod 3 with inner ramus greatly reduced. Telson tumid, not cleft.

Genotype, *Crybelocyphocaris tattersalli*.

***Crybelocyphocaris tattersalli*,**
new species.

Text-figs. 4, 5.

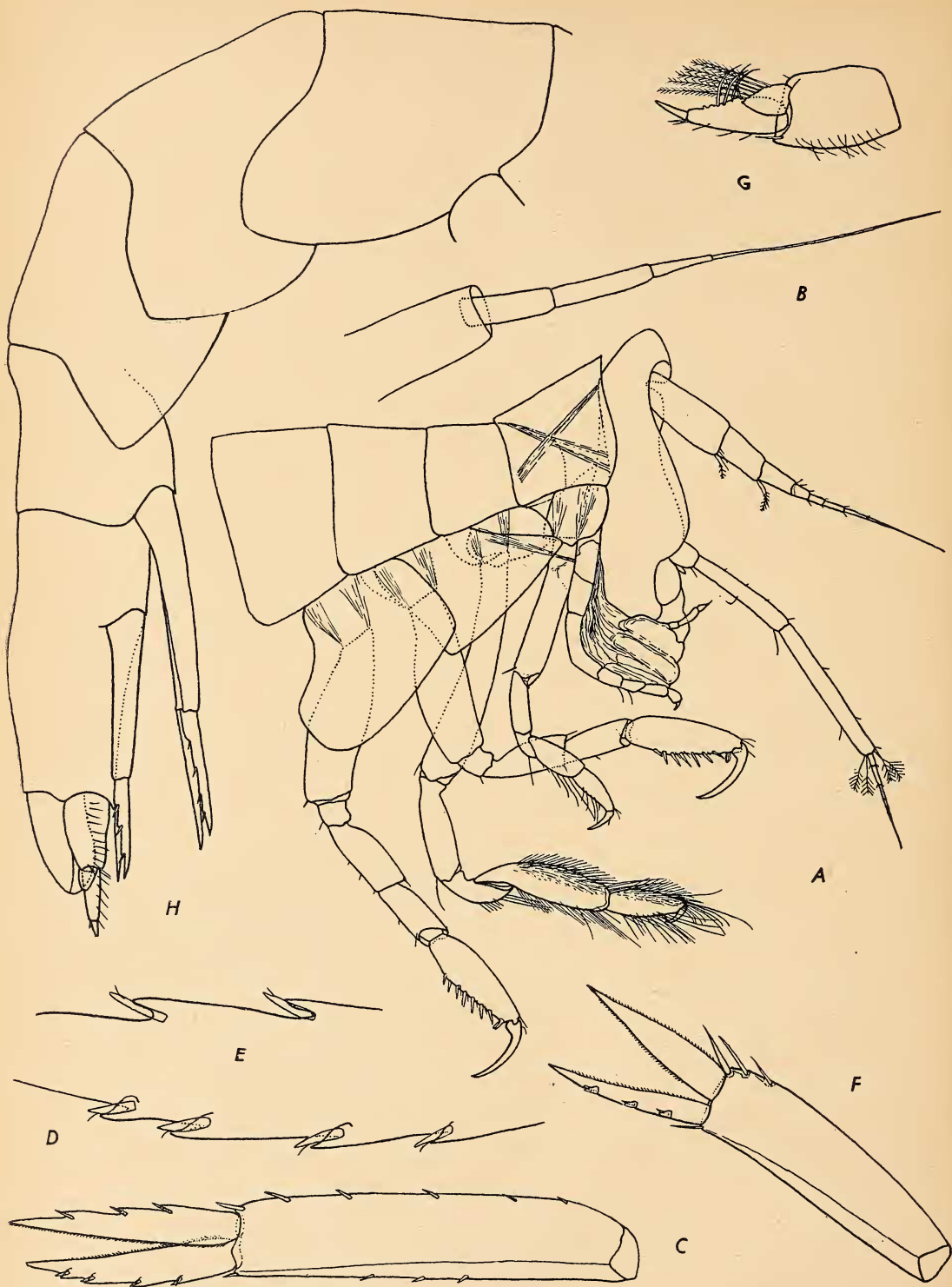
One specimen was taken at a depth of 600 fathoms.

Body with ventral surface bulging in the same manner as noted for *Paracyphocaris praedator*. Integument thin and weak and nearly transparent.

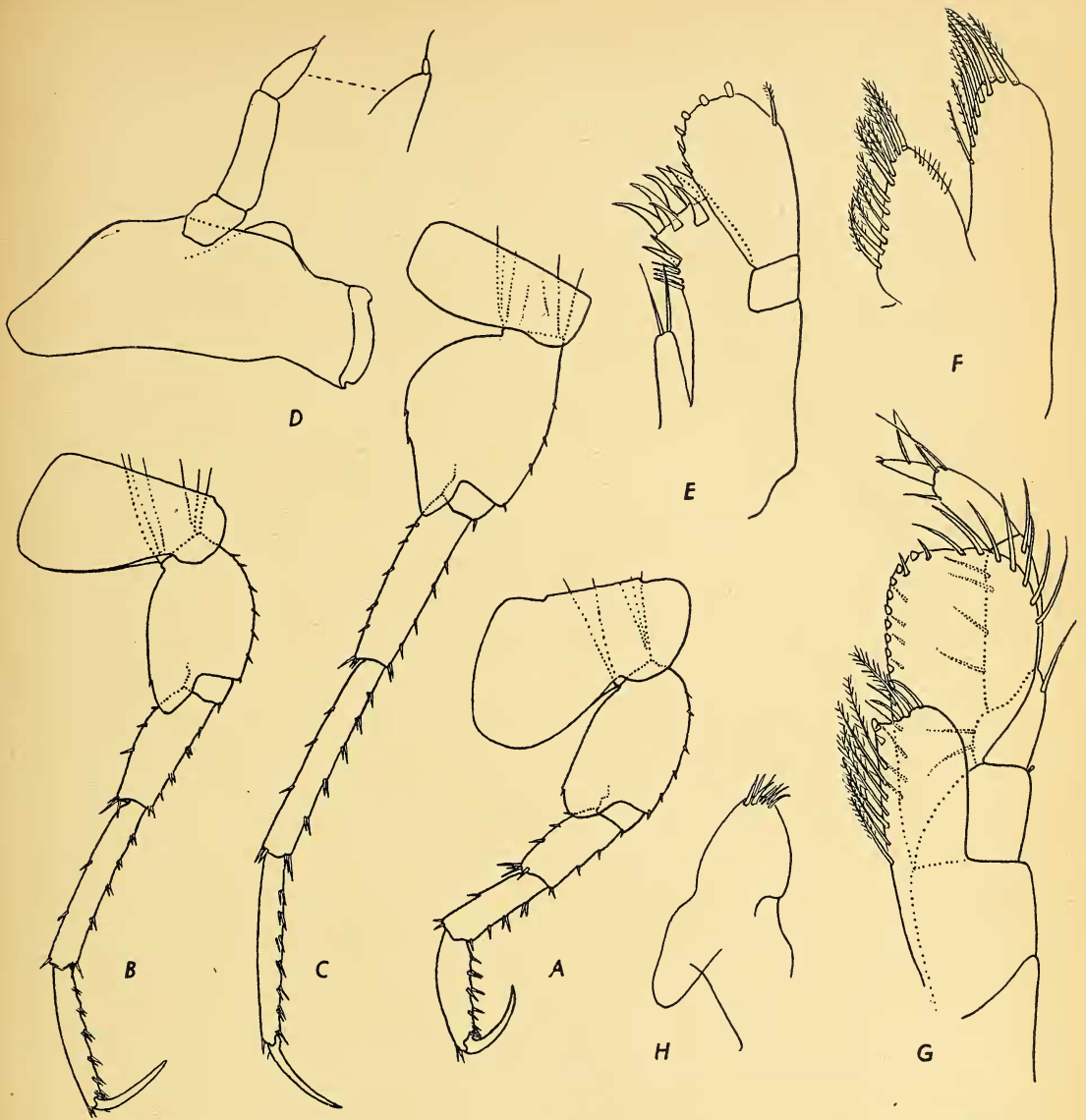
Head free, but probably capable of being withdrawn into the first body segment; front margin broadly lobed, without eyes; mouthparts very prominent. Antenna 1, flagellum about as long as the second and third peduncular joints combined, consisting of four joints, the last of which is long and slender and bears a long apical seta. Antenna 2, fifth joint longer than fourth, flagellum shorter than fifth peduncular joint and composed of

three joints, the last bearing a long apical seta.

Mandible with broad cutting-edge bearing a low tooth at upper end and an incision at the lower end; molar absent, but a low protuberance on the upper inner margin in front of the palp; palp 3-jointed, but weak and degenerate, third joint bearing apically a single spine which consists of an enlarged base carrying a slender seta. Maxilla 1, inner lobe elongate and bearing two apical setae; outer lobe armed on the upper margin with seven stout spine-teeth and on the inner margin with two stout spine-teeth and five or six slender spines; palp with second joint very broad distally and armed on the upper rounding margin with a plumose seta and six short teeth, the three distal ones being rounding and blunt. Maxilla 2, outer plate longer than inner; inner plate bearing on inner edge a row of submarginal plumose setae. Maxilliped, inner plate reaching to the end of the second joint of palp, bearing at the inner distal corner a low tooth below which on the outside is a short spine, and on the upper margin a



TEXT-FIG. 4. *Crybelocyphocaris tattersalli*, new gen. and new sp., male. **A**, anterior end of animal; **B**, end of antenna 2 enlarged; **C**, uropod 1; **D**, outer edge of outer ramus of uropod 1; **E**, inner edge of inner ramus of uropod 1; **F**, uropod 2; **G**, uropod 3; **H**, posterior end of animal.



TEXT-FIG. 5. *Crybelocyphocaris tattersalli*, new gen. and new sp., male. **A**, peraeopod 3; **B**, peraeopod 4; **C**, peraeopod 5; **D**, mandible; **E**, maxilla 1; **F**, maxilla 2; **G**, maxilliped; **H**, left half of lower lip.

long plumose seta and three short curved spines, inner margin bearing the usual row of plumose setae; outer plate very broad, inner margin armed on the upper half with very low, blunt teeth which do not project beyond the margin and a row of submarginal spinules on the outer surface; upper and outer margins armed with a row of seven long curved spines; palp rather weak, fourth joint short and straight, bearing a spine at the middle of the outer edge and a very short spinule and seta at the apex. Lower lip with rounding side lobes, but lacking inner lobes.

Gnathopod 1, fifth and sixth joints with

several setae on posterior margin, sixth joint slightly shorter than fifth and gradually narrowing distally, seventh joint rather strong and somewhat curved. Gnathopod 2 normal for the Lysianassidae; sixth joint much shorter than fifth; seventh joint considerably overlapping the short oblique palm. Peraeopod 1 slightly shorter than 2, but similar in structure; sixth joint strong and armed on posterior margin with a row of short, stout spines; seventh joint stout, curved, and closing against the spines of the sixth joint, forming an excellent clasping organ. Peraeopod 3 a little shorter than 2, sixth and seventh joints resembling those

of the two preceding peraeopods, but the spines of the sixth joint somewhat weaker. Peraeopod 4 longer than 3, but shorter than 5. The structure of these three peraeopods is clearly shown by Text-figs. 5a, b, c.

The metasome and urosome segments are noticeably elongate, and the former have rather bluntly rounding lower posterior angles. The second and third urosome segments are coalesced, forming one long joint. Uropod 1 not extending back as far as uropod 2, and uropod 2 not as far as uropod 3. Inner ramus of uropod 1 slightly the longer, and those of uropod 2 subequal. Uropod 3 with outer ramus slightly longer than peduncle and armed on inner margin with four stout curved spines; inner ramus half the length of the first joint of outer ramus, bearing a row of long plumose setae on inner margin, and apically acute. Telson very fleshy, extending back to about the middle of the first joint of outer ramus of uropod 3, base nearly as wide as last urosome segment, sides converging to the rather broadly rounding apex. Length about 11 or 12 mm. It is impossible to measure such flabby specimens accurately.

This strange deep-sea amphipod naturally joins the little group formed by *Paracyphocaris praedator*, *Metacyphocaris helgae* and *Crybelocephalus megalurus*. While it possesses many points of resemblance to these species, it nevertheless differs from them and from all other lysianassids by the coalescence of the second and third urosome segments. All four species have the short but very deep head, a very similar arrangement of the coxal plates, a simple first gnathopod, and the first three prehensile peraeopods. The antennae are quite similar in form, but *M. helgae* and *P. praedator* possess a small 1-jointed accessory flagellum, while *C. megalurus* and *C. tattersalli* are without an accessory flagellum. In *C. m.* the rami of the third uropods are subequal; in *P. p.* the inner ramus is about two-thirds the length of the outer; in *C. t.* it is about one-third the length of the outer; while in *M. h.* it is only about one-fifth the length of the outer. In *P. p.* the telson is deeply cleft; in *M. h.* it is slightly cleft, while in *C. m.* and *C. t.* it is not cleft.

Little is known about these peculiar amphipods. Of *M. h.* and *C. m.* only the male has been described, and of *P. p.* and *C. t.* the sex could not be determined, indicating that the specimens were immature. When mature specimens of both sexes of these four species have become known we shall be in a better position to judge of their relationship. It may be worthy of note that the first three peraeopods of the hyperiid *Microphasma agassizi* Woltreck bear a very close structural resemblance to those of this group of amphipods, which may merely mean that they have a similar function.

As this new genus combines characters possessed by some of the other genera, I have combined parts of their names to form a new genus, *Crybelocyphocaris*, with the idea of expressing this relationship.

FAMILY STEGOCEPHALIDAE.

Euandania gigantea (Stebbing).

Andania gigantea Stebbing, 1883, p. 206.

Andania gigantea Stebbing, 1888, p. 730, pl. 35.

Euandania gigantea Stebbing, 1899a, p. 206.

One specimen taken at a depth of 700 fathoms.

Distribution.—This species was described by Stebbing from off Marion Island, about 46° S., 45° E. Walker recorded an immature doubtful specimen 9 mm. in length from McMurdo Sound in the Antarctic. Barnard recorded a single specimen west of Cape Town (33°07' S., 4°30' E.). The present Bermuda record extends the range greatly northward.

Stebbing recorded two specimens, the larger of which measured about 50 mm. in the curved position in which it is figured, but would have measured considerably more if it had been straightened out. The smaller specimen measured about 40 mm. in the extended position. Barnard's specimen, a female, was 33 mm. in length. The present Bermuda specimen, which measures about 35 mm., is the fourth authentic specimen to be recorded.

The integument in the present specimen is very thin, soft and transparent, and the thorax, which is greatly distended, is filled with a colorless transparent liquid. The third uropods are perfect and agree with the description given by Barnard (1932, p. 80) for those of his specimen. The telson is very short and is cleft for about one-third of its length as figured by Stebbing.

Parandania boeckii (Stebbing).

Andania boeckii Stebbing, 1888, p. 735, pl. 36.

Stegocephalus boeckii Della Valle, 1893, p. 628, pl. 59, fig. 36.

Parandania boeckii Stebbing, 1899a, p. 206.

Seventeen specimens were taken at depths between 600 and 1,000 fathoms.

Distribution.—This species was described by Stebbing from off Pernambuco, Brazil (8° 37' S., 34° 28' W.). It has since been recorded from Baffin Bay (76° N., 62° W., Stephensen), southward through the Atlantic to the South Shetland Islands (Barnard). From the Indian Ocean it has been recorded by Walker (8° 16' S., 51° 26' E.), Schellenberg (4° 6' S., 73° 25' E.), and Barnard (Arabian Sea). It has not been recorded from the Pacific. The present records are the first for Bermuda.

Some of the females recorded by Barnard from Bouvet Island (52° 25' S., 9° 50' E.) measured 28 mm. in length and appear to be the largest specimens of this species yet recorded. The largest specimens taken at Bermuda are about 22 mm. Most of the specimens are rather firm and of a brownish color, but the integument of a few is quite soft and collapsible, as noted by Stephensen (1933, p. 22) for his Greenland specimens.

FAMILY PARDALISCIDAE.

Halice aculeata Chevreux.

Text-figs. 6, 7.

Halice aculeata Chevreux, 1912, p. 1, figs. 1-2.

Halice aculeata Chevreux, 1935, p. 88, pl. 13, figs. 5, 10.

Three specimens were taken at depths between 100 and 1,000 fathoms.

Distribution.—Chevreux described this species from a single male taken off the Atlantic coast of Morocco (32° 21' 30" N., 12° 31' W.).

Up to the present time the original male has been the only recorded specimen. The three Bermuda specimens are all females, and I have figured some of the appendages of one of them. These females measure 13 or 14 mm. in length, while Chevreux's male measured only 6.5 mm., which would seem to indicate that it was an immature specimen. The accessory flagellum of the first antenna is about three-fourths as long as the long first joint of the primary flagellum, and is composed of a long proximal joint and two short terminal joints. The fourth pereopod is longer than the fifth. All the appendages appear to be stouter than in the male, but this may be due to the larger size of the female. The present record extends the range of this little known species considerably westward.

FAMILY SYNOPIIDAE.

Synopia ultramarina Dana.

Text-fig. 8.

Synopia ultramarina Dana, 1852, p. 995, pl. 68, fig. 6, 7.

Synopia orientalis Kossmann, 1880, p. 137, pl. 15, figs. 11-13.

Synopia scheeleana Bovallius, 1886, p. 16, pl. 2, figs. 22-29.

Fifty specimens were taken at the surface.

Distribution.—Found in all tropical and subtropical seas. So far as I am able to ascertain, it has not heretofore been reported from Bermuda.

The usual length of this species is from 2 to 5 mm., but there are specimens in the U. S. National Museum taken at the Bahamas which measure 7 mm. The Bermuda specimens are about 4 mm.

Schellenberg (1926, p. 341, 342) regards

all the forms which have been described with a cleft telson as varieties of the original species *ultramarina*. The telson appears to be subject to considerable variation and I have figured this appendage of a specimen from Bermuda, in order to show one of these variations.

FAMILY CALLIOPIIDAE.

Stenopleura atlantica Stebbing.

Stenopleura atlantica Stebbing, 1888, p. 950, pl. 84.

Acanthozone atlantica Della Valle, 1893, p. 601, pl. 59, fig. 10.

Eight specimens were taken at depths between 200 and 900 fathoms.

Distribution.—Stebbing described this species from the tropical Atlantic. It has since been recorded from the Atlantic from 36° N. to 35° S. Walker recorded it from the western part of the Indian Ocean, and Schellenberg has recorded it from the southern part of that ocean. It has not heretofore been recorded from the Bermuda region.

The largest specimens recorded are 8 mm. in length. The Bermuda specimens measure from 5 to 5.5 mm.

FAMILY EUSIRIDAE.

Cleonardo microdactyla Stephensen.

Text-fig. 9.

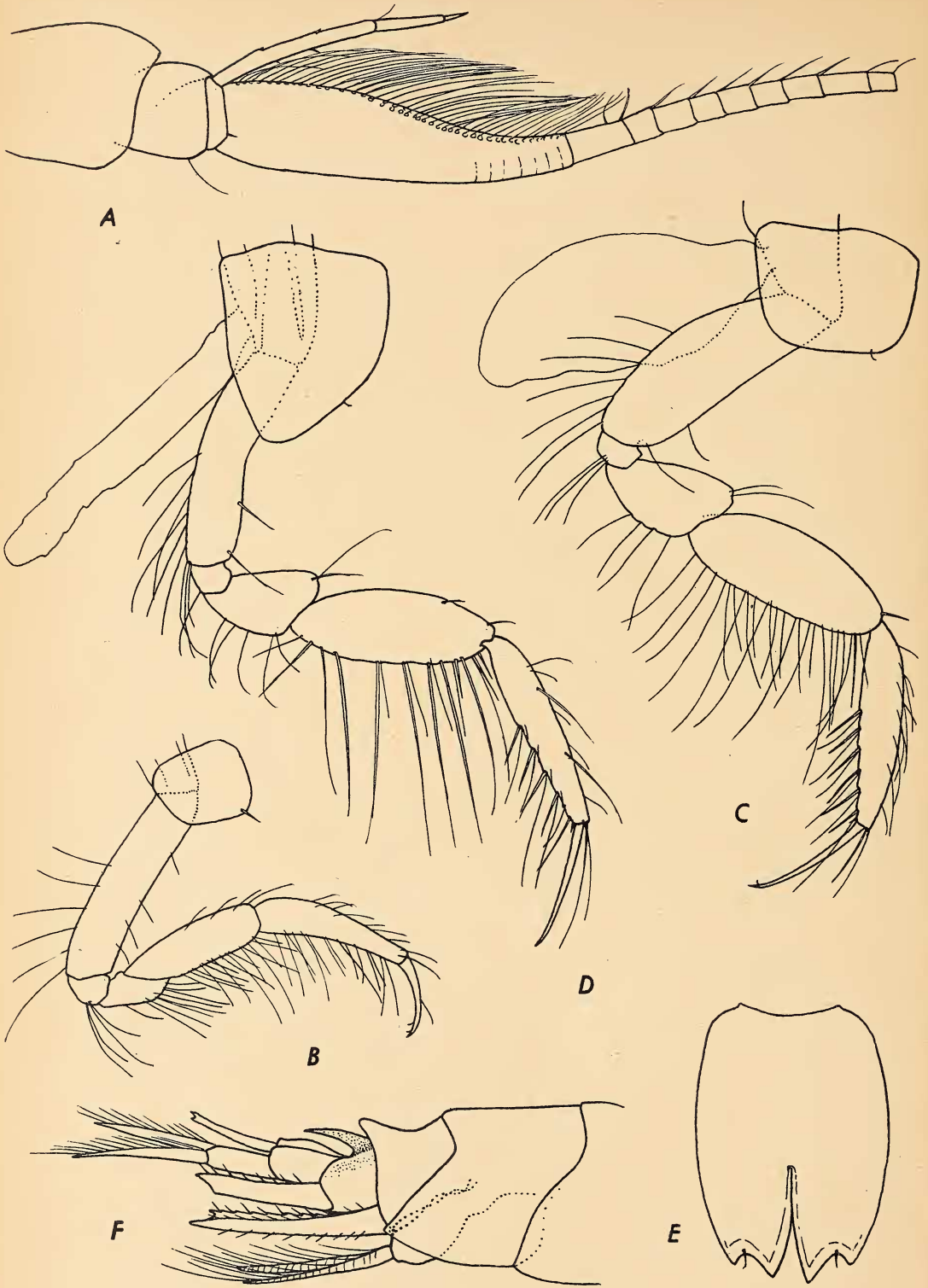
Cleonardo microdactylus Stephensen, 1912a, p. 90, figs. 3, 4.

Cleonardo microdactyla Stephensen, 1933, p. 40, fig. 19.

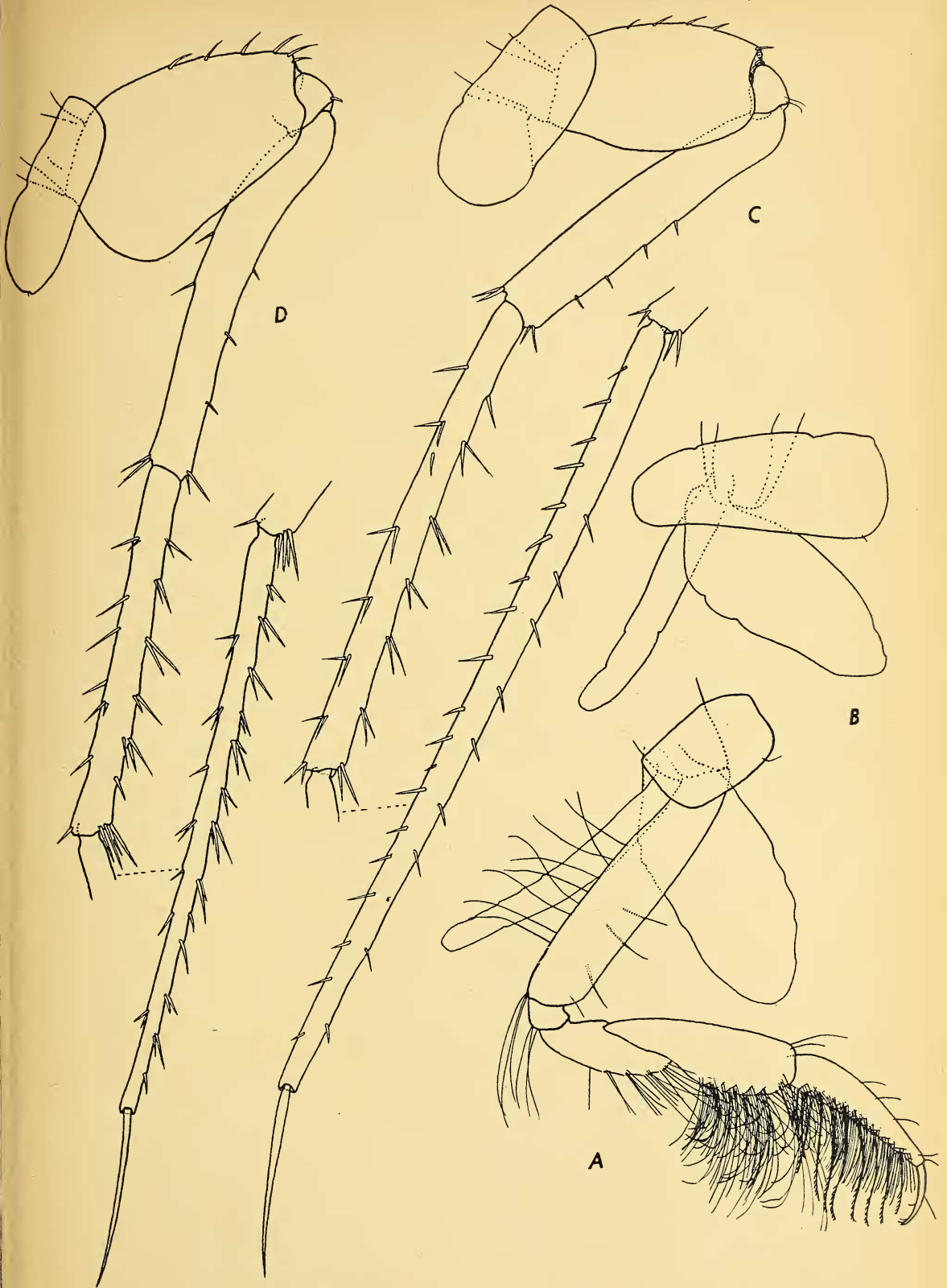
Three specimens were taken at depths between 600 and 800 fathoms.

Distribution.—This species was described by Stephensen from off the southwest coast of Greenland (64° 06' N., 55° 18' W.) from two females. In June, 1922, a single female was taken by the *Armauer Hansen* off the Bay of Biscay (47° 10' N., 18° 02' W.) and recorded by Pirlot in 1929. In 1933 Stephensen again recorded four specimens from off the southwest coast of Greenland and two small specimens from the waters south of Greenland. The three specimens from Bermuda extend the range of the species somewhat to the south and constitute the first records for the Western Atlantic.

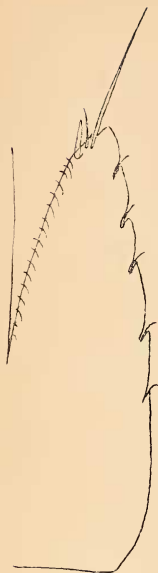
All the specimens of this species so far taken, of which the sex has been determined, are females. Stephensen believes that this species is most closely related to *C. longirostris* Chevreux, and this view is probably correct, but Chevreux's figures are so completely lacking in detail that a definite decision is impossible. *C. microdactyla* appears to be rather closely related also to *C. appendiculata* (Sars) and *C. longipes* Stebbing. Many of the apparent differences among the species of *Cleonardo* may be due to sex, size or individual variation, as Stephensen



TEXT-FIG. 6. *Halice aculeata* Chevreaux, female. **A**, antenna 1; **B**, gnathopod 1; **C**, peraeopod 1; **D**, peraeopod 2; **E**, telson; **F**, posterior end of animal.



TEXT-FIG. 7. *Halice aculeata* Chevreux, female. A, gnathopod 2; B, coxal plate of peraeopod 3; C, peraeopod 4; D, peraeopod 5.



TEXT-FIG. 8. *Synopia ul-tramarina* Dana. Telson.

has suggested. Our acquaintance with this genus is so limited at present that it is scarcely possible to gauge the correct relation of the species which have been described. Of some of the species only one sex is known, which adds further to the difficulty.

The present specimens, which are all females, agree quite well with Stephensen's description and figures (1933, p. 40, fig. 19). I have figured some of the appendages showing details which have not heretofore been recorded.

The first antenna does not have an accessory flagellum. The third peduncular joint, however, is produced at the lower inside distal margin into a narrow lobe having somewhat the appearance of a small one-jointed flagellum, but it is not separated from the joint by an articulation. In my figure (Text-fig. 9b) the line which appears to separate this lobe from the third joint is the articulation between the third joint and the first flagellar joint and is on the outside, while the lobe is on the inside and has no articulation.

Gnathopod 1 bears a row of submarginal plumose setae on the inside front margin of the second joint. The defining angle of the palm is armed with three marginal spines, two of which are longer than the third, and submarginal to these on the inside surface is a row of five spines. The defining angle of the palm of gnathopod 2 is similarly armed except that the row on the inner surface contains four spines instead of five. Peraeopod 1 is not quite as long as peraeopod 2, but very much the same in general proportions. The fourth joint bears on both front and hind margins very long plumose setae. The dactyl is over

half the length of the sixth joint. The third, fourth and fifth peraeopods increase slightly in length consecutively and are very much alike in construction. The inner surface of the second joint bears a row of long plumose setae. The dactyl is a little less than half the length of the sixth joint. The third uropods reach very slightly beyond the apex of the telson, the inner ramus is longer than the outer, both are armed on their outer and inner margins with short spines, and all four margins bear extremely fine dentations which are discernible only by a high power of the microscope. The telson is very deeply cleft and is unarmed, but bears on the outer margins and the extremity of the cleft edges very fine dentations similar to those of the rami of the third uropods. The length of these mature females is about 7 mm. Stephensen gives 8 mm. for two of the females from the west coast of Greenland.

Eusirella elegans Chevreux.

Text-fig. 10.

Eusirella elegans Chevreux, 1908, p. 12, figs. 7, 8.

Eusirella valdiviae Schellenberg, 1926b, p. 228, fig. 19.

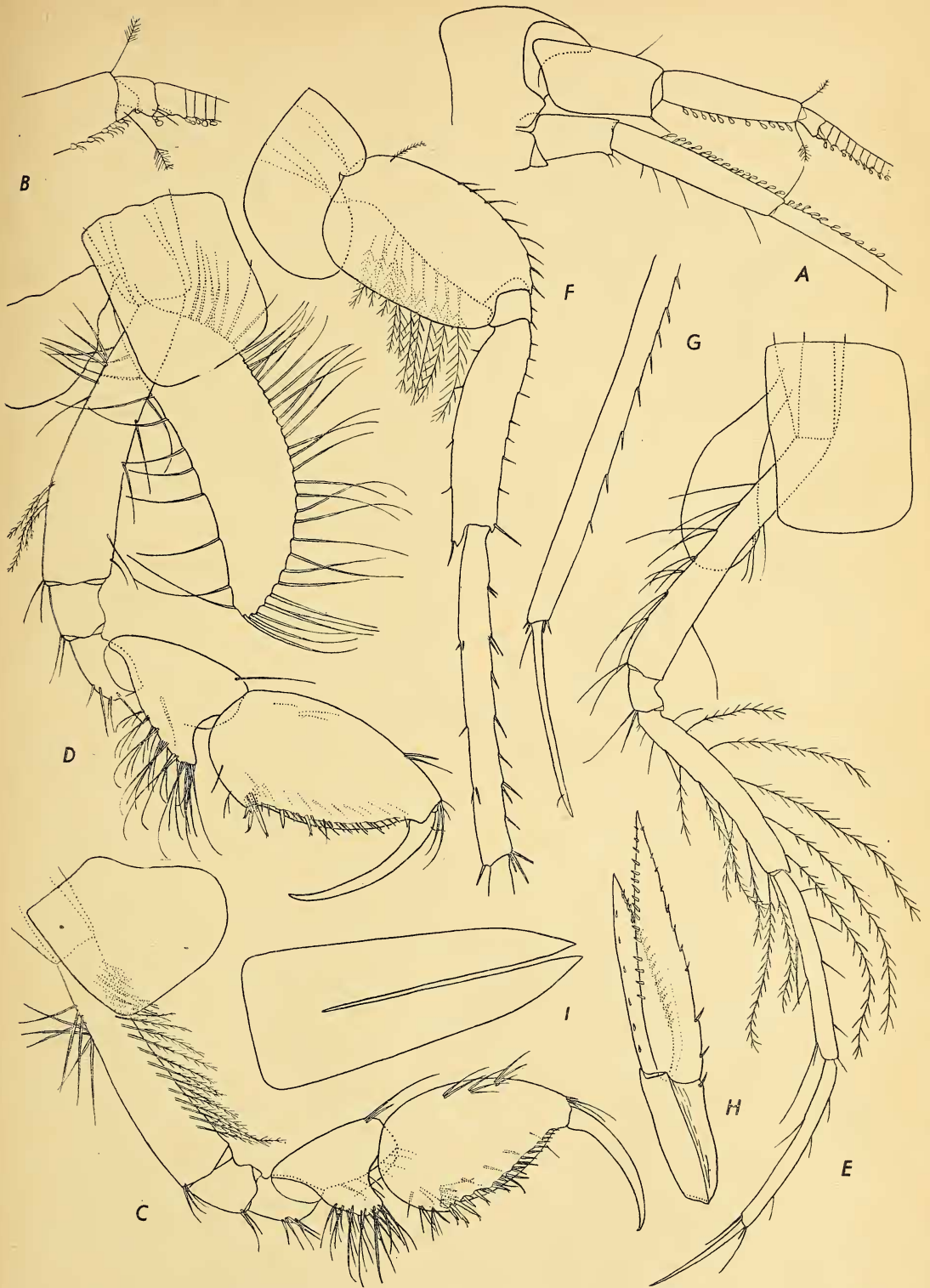
Gracilipes multicalceolus Thorsteinson, 1941, p. 85, pl. 7, figs. 71-77.

One specimen was taken at a depth of 1,000 fathoms.

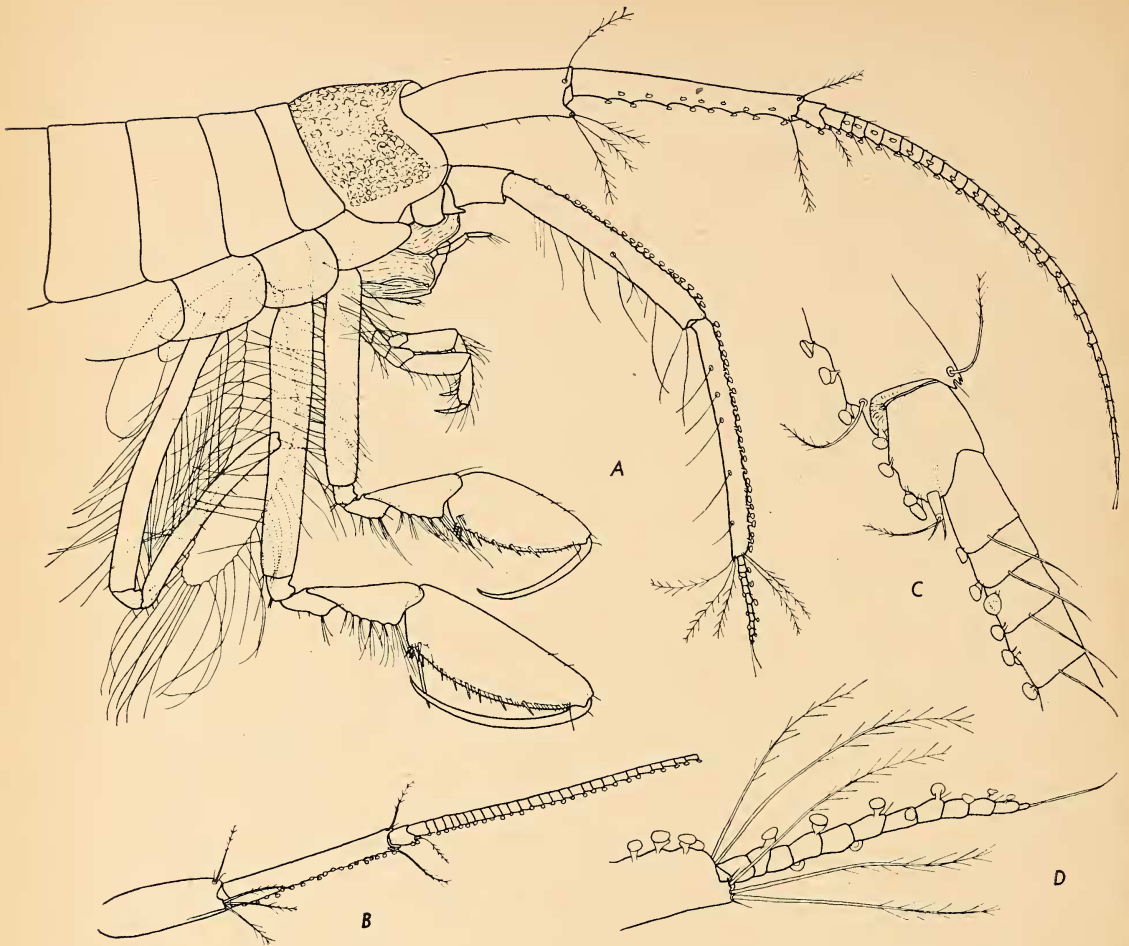
Distribution.—This species was described by Chevreux from the vicinity of the Azores (38°04' N., 26°07' W.). Schellenberg in 1926 described *E. valdiviae* from the South Atlantic (31°21' S., 9°46' E.). In 1932 Barnard also recorded it from the South Atlantic (33°53' S., 9°26' E.). Thorsteinson in 1941 recorded it from the Gulf of Alaska, North Pacific (*Gracilipes multicalceolus*). The present record is the first for the western North Atlantic.

The present specimen is a mature female measuring 10 mm. in length. Barnard believes that Chevreux's and Schellenberg's specimens represent the two sexes of the same species, the former the female and the latter the male. Both specimens are probably small and immature, measuring only about 5 mm.

The Bermuda specimen possesses the following characters: the eyes are rather poorly defined, but appear to be much as figured by Schellenberg for *E. valdiviae*. Antenna 1 is nearly as described by Barnard (1932, p. 194) for his Southeast Atlantic specimen, a male measuring 8.5 mm. The first peduncular joint bears the chisel-shaped tooth on the lower distal corner, but carries three plumose setae instead of two. The third joint bears a small, but distinct 1-jointed accessory flagellum. The primary flagellum is composed of about thirty joints. The



TEXT-FIG. 9. *Cleonardo microdactyla* Stephensen, female. A, head and antennae; B, antenna 1 greatly enlarged showing the small distal projection of third joint; C, gnathopod 1; D, gnathopod 2; E, peraeopod 1; F, peraeopod 4; G, sixth and seventh joints of peraeopod 4; H, uropod 3; I, telson.



TEXT-FIG. 10. *Eusirella elegans* Chevreaux, female. **A**, anterior end of animal; **B**, antenna 1 showing under side; **C**, antenna 1 enlarged showing accessory flagellum; **D**, end of antenna 2 enlarged.

lower margin of the second and third peduncular joints and the flagellum bear calceoli. Antenna 2 is much as figured by Schellenberg for *E. valdiviae* (1926, p. 229, fig. 19), but the flagellum consists of twelve joints.

The gnathopods are rather long and slender, but not as slender as figured by Schellenberg, though much slenderer than figured by Chevreaux (1908, p. 13, fig. 7). The palms are very long, leaving only very short hind margins to the sixth joints, and are defined by blunt angles carrying groups of spines, one of the spines being much longer than the rest. The peraeopods are all imperfect. The third peraeopod lacks only the seventh joint and is proportionally about as figured by Schellenberg. The second joint of third, fourth and fifth peraeopods is narrow and like Chevreaux's figures (1908, p. 14, fig. 8). The lower margins of

the metasome segments are broadly and evenly rounding and possess no angles. The uropods all reach back to the same point and are as characterized by Barnard, "rami sparsely spinose, with the margins very minutely serrulate." Telson reaching to the end of the peduncle of uropod 3, cleft nearly to its base, but the lobes separated only distally; the lobes apically acute, each with a very minute notch and setule as observed by Barnard.

Owing to the very close resemblance of the figures of *Gracilipes multicalceolus* to the figure of *E. valdiviae*, I believe them to be synonymous. Both represent the male, but there are a few discrepancies which may possibly be accounted for by the difference in maturity of the specimens. The gnathopods of *G. m.* are armed with a row of spines on the hind margin of the sixth joints, while in *E. valdiviae* these spines ap-

pear to be lacking, or at least are not shown in the figure. The antennae of *G. m.* are much more densely calceoliferous than those of *E. v.*, but this again may be due to the greater maturity of the former. Unfortunately, most of the figures which have been given of this genus are sadly lacking in detail, which greatly hinders the clarifying of the status of this species.

***Eusiropsis riisei* Stebbing.**

Eusiropsis riisei Stebbing, 1897, p. 39, pls. 13, 14.

Eight specimens were taken at depths between 300 and 800 fathoms.

Distribution.—This species was described by Stebbing from the tropical Atlantic. Walker in 1909 recorded it from the Seychelles. In 1926 Schellenberg recorded it again from the tropical Atlantic, and in 1929 he recorded it from the eastern tropical Pacific from specimens taken by the steamer *Albatross* in 1904 and 1905. Pirlot in 1934 recorded it from the East Indies, and Barnard in 1937 recorded it from the Arabian Sea.

A female from the eastern tropical Pacific measuring 13 mm., recorded by Schellenberg, appears to be the largest specimen so far brought to light. The Bermuda specimens measure between 8 and 10 mm. and the largest female carries eggs.

FAMILY TALITRIDAE.

***Hyale galatæae* Stebbing.**

Hyale galatæae Stebbing, 1899b, p. 402, pl. 31B.

One specimen was taken at a depth between the surface and 400 fathoms.

Distribution.—Stebbing described this species from specimens in the Copenhagen Museum which were taken at the following localities: Pacific, 37°32' N., 179°43' E.; 4°30' N., 137° E. Atlantic, one male from the Sargasso Sea; and one female, 26°20' N., 58°40' W., which is about the eastern edge of the Sargasso Sea. Chevreux records five specimens from 31°45'30" N., 42°42'30" W., and four specimens from 30° N., 42° W., which localities are also about the eastern edge of the Sargasso Sea. All the Atlantic specimens have been taken in the Sargasso Sea region, but the present specimen constitutes the first record for Bermuda.

Stebbing gives 4 mm. as the length of this species, and the present specimen, which is a male, is about this length.

Four hundred fathoms is given as the depth of the haul for net 1101, but this specimen must have been taken as the net came to the surface, as the species of *Hyale* are shallow water forms.

***Thoriella islandica* Stephensen.**

Text-fig. 11.

Thoriella islandica Stephensen, 1915, p. 39, fig. 23.

One specimen was taken at a depth of 900 fathoms.

Distribution.—This species was described by Stephensen from a single specimen taken by the *Thor* a few degrees south of Iceland (61°30' N., 17°08' W.), and was thought to be a female on account of the rather short cylindrical vesicles, considered to be underdeveloped marsupial plates, which accompanied the branchiae of the second to fifth thoracic appendages. A second immature female was recorded by Barnard from the Gulf of Oman in 1937.

Stephensen's specimen measured 19 mm. Barnard's specimen measured 18 mm. to end of telson and 22 mm. to end of first uropod. The Bermuda specimen measures 16 mm. in the curved position in which it is figured, but would undoubtedly measure 19 or 20 mm. if the animal were straightened out. Both Barnard's and the present specimen differ in a few details from the *Thor* specimen, but he nevertheless did not question the identity of his specimen, and I am not questioning the identity of the Bermuda specimen.

The antennae are considerably longer than in the *Thor* specimen, and are subequal in length. Both flagella are of about the same thickness, and are of the same thickness throughout their length. The flagellum of the first antenna consists of 20 joints and that of the second of 21 joints. The sixth joint of the second gnathopod bears a short dactyl which ends in a broad spine, as described by Stephensen, and which was lacking in Barnard's specimen. The first four coxal plates are slightly different from those figured by Stephensen. The first and second uropods, though of the same proportions, differ in detail from Stephensen's figures of these appendages. The outer ramus of these uropods is thick and cylindrical, ending rather abruptly in a small blunt point. The inner rami are slender and much shorter than the outer. The third uropods appear to be as described and figured by Stephensen.

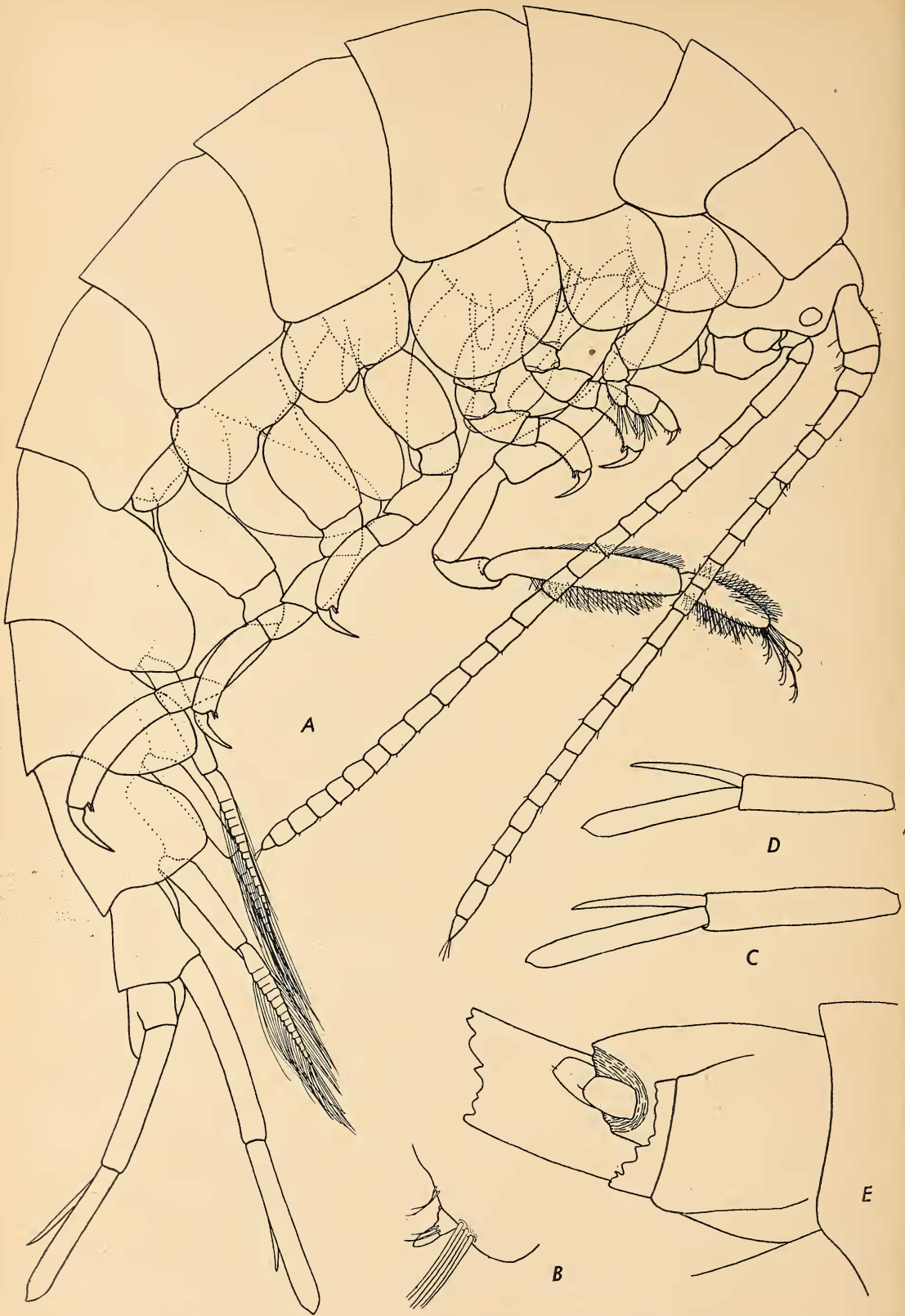
The present specimen is only the third recorded of this remarkably aberrant member of the family Talitridae.

FAMILY AMPITHOIDAE.

***Sunamphitoe pelagica* (Milne Edwards).**

Amphithoe pelagica Milne Edwards, 1830, p. 378.

Sunamphithoe hamulus + *S. conformata* Bate, 1862, p. 250, Pl. 43, fig. 5; p. 251, Pl. 43, fig. 6.



TEXT-FIG. 11. *Thoriella islandica* Stephens, female. **A**, entire animal; **B**, end of sixth joint of gnathopod 2; **C**, uropod 1 from above; **D**, uropod 2 from above; **E**, end of urosome showing uropod 3.

Sunamphithoe conformata Sars, 1894, p. 585, pl. 208.

Sunamphithoe pelagica Chevreux, 1900, p. 102, pl. 11, fig. 4.

One specimen taken near the surface.

Distribution.—This species has been recorded from the warm and temperate areas of the North Atlantic. The present record is the first for Bermuda.

The single specimen from Bermuda is a small female, between 4 and 5 mm. in length, carrying one egg. The mandibular palp is absent and the specimen agrees in all characters with *S. pelagica*. Both Stebbing and Chilton have noted the close resemblance between this species and *Ampithoe femorata* (Kröyer). I have examined specimens from North Carolina, Tortugas and Brazil, which could be identified either as *Sunamphithoe pelagica* or *Ampithoe femorata*, depending upon the development of the mandibular palp. In some the palp is lacking and in others it is well developed, while many gradations between these extremes can be noted. In the genus *Ampithoe* there are a number of species, which, from the possession of several characters in common, seem naturally to form a homogeneous group. *S. pelagica* and *A. femorata* belong to this group, and it may be that eventually they will be considered variations of the same species.

S. pelagica usually measures between 5 and 8 mm. but Stebbing (1906, p. 645) gives 8 to 17 mm. as the length. The length of *S. hamulus* Bate, which Stebbing considers a synonym of *S. pelagica*, is given as 14/20 of an inch and this is equal to about 17 mm.

FAMILY HYPERIOPSIDAE.

Hyperiopis tridentata Barnard.

Text-figs. 12, 13.

Hyperiopis tridentata Barnard, 1937a, p. 147, fig. 4, ♀.

One specimen was taken at a depth of 1,000 fathoms.

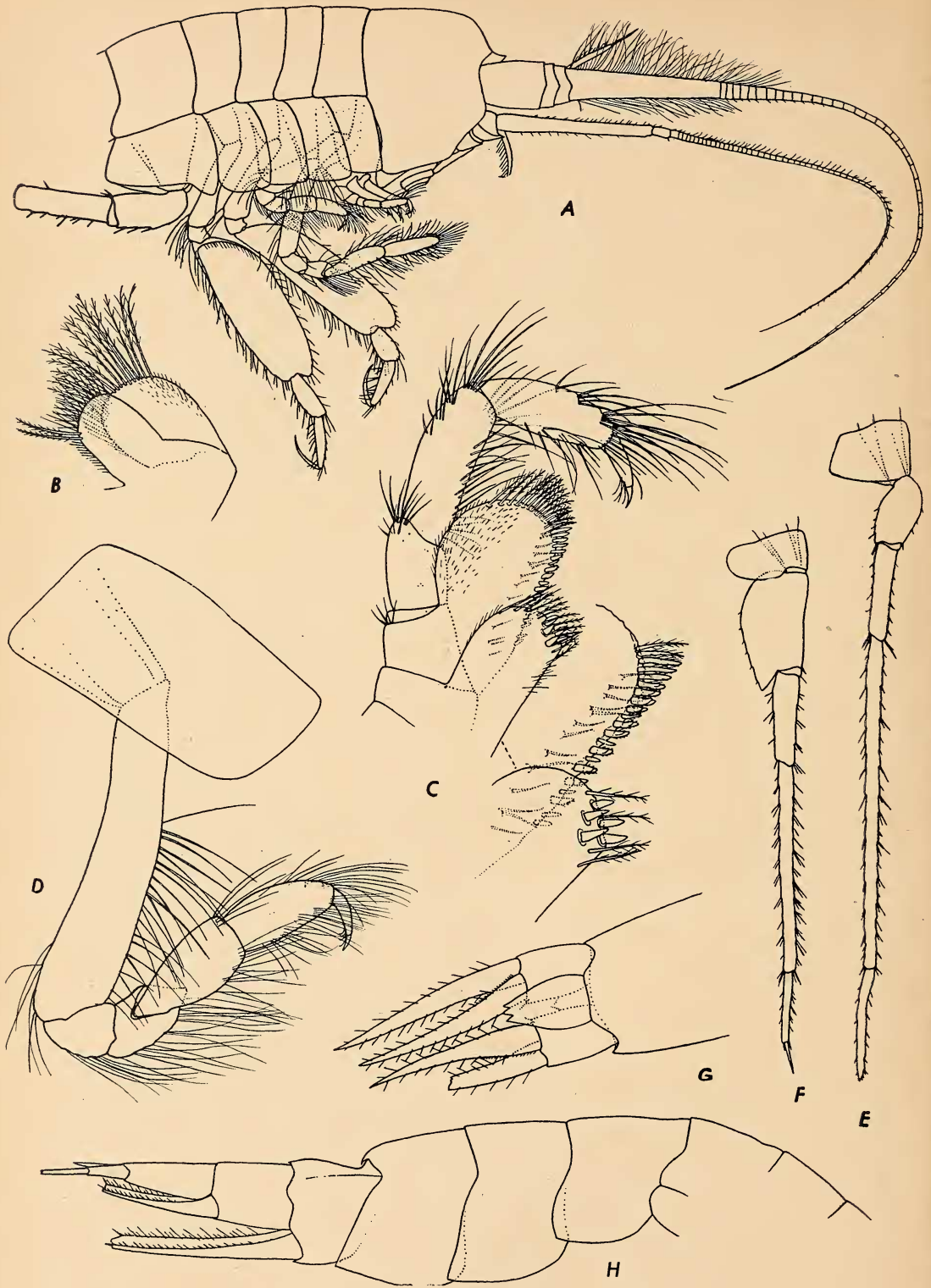
I have identified this specimen as *Hyperiopis tridentata* Barnard with some hesitancy, as I am unable to compare some of its characters with that species. Barnard describes only the first and second gnathopods and first peraeopod, which he says do not differ from those of *H. voringii* and resemble Stephensen's figures of that species (1934, p. 6, fig. 1, p1, p2, and p. 10, fig. 4, p3). Barnard does not mention peraeopod 5, which in the present specimen is quite different from that of either *H. voringii* Sars or *H. gibbosa* Pirlot. The hind margin of the second joint of this peraeopod is produced below into a conspicuous angular pointed lobe which is not the case with this joint in either *H. v.* or *H. g.* It would seem that if the fifth peraeopods were present in *H. tridentata* and the second joint bore this char-

acter, Barnard could scarcely have failed to have mentioned it.

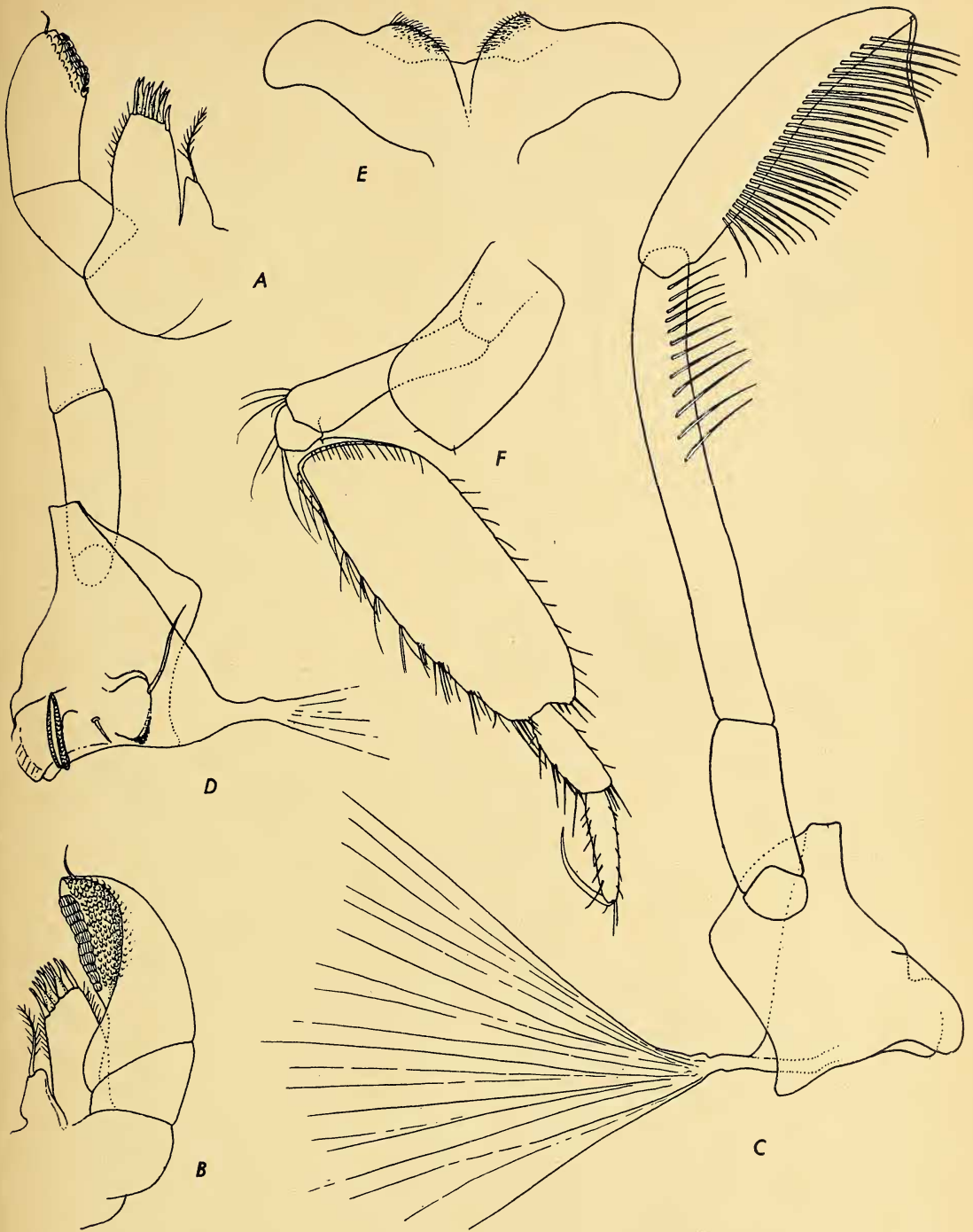
Barnard's specimen was a female 8 mm. in length. The Bermuda specimen measures about 16 mm. in length, and appears to be an immature female. There are no male sexual organs present, gnathopod 2 and peraeopods 1-5 bear large branchiae, and gnathopod 2 and peraeopods 1-3 bear small, cylindrical, undeveloped marsupial plates.

The head bears a short, broadly triangular rostrum. Eyes absent. Antenna 1, accessory flagellum about half the length of the first joint of primary flagellum and composed of one long and two short joints. Upper lip is unsymmetrical and is as figured by Stephensen for *H. voringii* (1934, p. 7, fig. 2). Right mandible with very broad, double-edged accessory plate; one spine in spine-row; molar long and narrow with a prominent seta at upper corner and a few short teeth at the lower corner; palp very long, first joint about one-third the length of the second, and third about three-fourths the length of the second. The first maxillae are not symmetrical, the right palp being very much stronger and more robust than the left. The armaments of the inner and outer plates and palp are as I have figured them, which is practically the same as described and figured by Stephensen for *H. voringii* (1934, p. 8, fig. 1). Maxilla 2, outer plate much wider than inner; the inner plate wider in proportion than is figured by Stephensen for *H. v.* (1934, p. 8, fig. 3). Maxillipeds, inner plate reaching to about the middle of outer plate and armed distally with plumose setae and five spine-teeth; outer plate rather wide, upper and outer margins forming a broadly rounding curve, inner margin armed with a row of closely set teeth, which are of a peculiar complicated structure, the outer surface of plate bearing a submarginal row of setae; palp shorter and stouter than is shown by Stephensen for *H. voringii* (1934, p. 7, fig. 2Mxp.), the second joint is very little longer than third, fourth joint bearing nail at base of which are several setules. Lower lip shallow, without inner lobes, lateral lobes very long, curved and bluntly rounding apically.

Gnathopod 1, second joint a little longer than the third to sixth joints combined, fifth joint a little longer and wider than sixth, seventh joint bearing nail at base of which are several setules. Gnathopod 2 much as figured by Stephensen for *H. v.* (1934, p. 6, fig. 1 p2), but perhaps proportionately a little longer and narrower. Peraeopods 1 and 2 much alike; fourth joint of peraeopod 1 produced distally into a rounding lobe; fourth joint of peraeopod 2 wider and forward lobe less pronounced than in peraeopod 1; the proximal end of this joint is reinforced by a stout chitinous ridge bearing a row of five setules. Peraeopods 3 to 5 slender. The second joint of peraeopod 3 is not ex-



TEXT-FIG. 12. *Hyperiopis tridentata* Barnard. **A**, anterior half of animal; **B**, maxilla 2; **C**, maxilliped; **D**, gnathopod 1; **E**, peraeopod 4; **F**, peraeopod 5; **G**, uropod 3 and telson; **H**, posterior half of animal.



TEXT-FIG. 13. *Hyperiopis tridentata* Barnard. **A**, maxilla 1; **B**, maxilla 1, showing inside of palp; **C**, right mandible from outside; **D**, right mandible from inside; **E**, lower lip; **F**, peraeopod 2.

panded, and that of peraeopod 4 is very slightly expanded. Peraeopod 5 shorter than peraeopod 4, the second joint is well ex-

panded and its hind margin is produced below into a conspicuous angular lobe.

Metasome segment 1 is bluntly angular be-

low and segments 2 and 3 are sharply angular. The telson and uropods are as described and figured by Barnard (1937, p. 147, fig. 4). Telson extending beyond the peduncle of uropod 3, margins convex and converging to the narrow tridentate apex.

There are few records of the occurrence of this deep sea genus of amphipods. Sars in 1885 described the genus and the genotype, *H. voringii*, from the Arctic Ocean (72° N., 5° E.) and off the coast of Norway (64° N., 4° E.). In 1934 Stephensen redescribed and fully figured *H. voringii* from specimens in the Monaco collection which were taken in the Atlantic in 1898 (69°18¼' N., 12°09' E.). In 1906 Walker described the species *H. australis* taken by the *Discovery* in Antarctic waters. The status of this species, however, cannot be determined, as it is insufficiently described. Pirlet in 1934 described *H. gibbosa* taken by the *Siboga* Expedition in 1899, in the East Indies (0°17.6' S., 129°14.5' E.). In 1937 Barnard described *H. tridentata* taken in the North Arabian sea by the John Murray Expedition, in 1933. It is seen that the genus is widely distributed, but of the distribution of the species practically nothing is known. The present Bermuda record, however, indicates a rather wide range at least for the species *H. tridentata*.

Suborder 2. Hyperiidea.

FAMILY LANCEOLIDAE.

Lanceola pelagica Say.

Text-fig. 14.

Lanceola pelagica Say, 1818, p. 318.

Lanceola sayana Bovallius, 1885, p. 7, figs. 1, 1a and 1b.

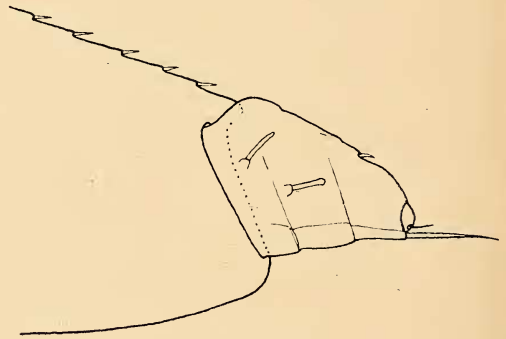
Lanceola sayana Bovallius, 1887a, p. 30, pl. 4, figs. 1-19; pl. 5, fig. 1.

Lanceola sayana var. *typica* + var. *longipes* Woltereck, 1909, p. 158.

Four specimens were taken at depths between 700 and 1,000 fathoms.

Distribution.—This species is widely distributed. Stephensen (1912, p. 612) records it 63° N., 54° W. in the southern part of Davis Strait. From the eastern North Atlantic there are numerous records. Woltereck records it from the South Atlantic (1927, p. 60, 35° S., 18° W.) and from the Antarctic Ocean (1927, p. 60, 64° S., 85° E.). Woltereck recorded it from the Eastern Pacific (1909, p. 159, *Albatross* Station 4604, off Nicaragua, and Station 4665, off Peru). Walker recorded it from the Indian Ocean (1909, p. 53). Barnard (1937, p. 178) recorded it from the Arabian Sea. Say (1818, p. 318) merely says that two specimens were found by Capt. Hamilton in the Gulf Stream. The specimens from Bermuda are the first recorded from these islands which lie on the outer edge of the Gulf Stream.

When Bovallius in 1885 (p. 3) definitely established the status of Say's genus *Lanceola* he carefully compared Say's description of the genus and the species *pelagica* with the description of a species of *Lanceola* which he was describing. As the only known species of *Lanceola* possessing the specific characters mentioned by both Say and Bovallius is *L. sayana*, I consider *sayana* to be a synonym of *pelagica*. Stebbing (1904, p. 29) says, "It is possible that Say's *L. pelagica* may be identical with the *L. sayana* of Bovallius, since the chief mark of distinction rests on a measurement which, at the date when Say wrote, was not likely to have been made with much exactness." Stephensen (1918, p. 9) places *pelagica* questionably as a synonym of *sayana*.



TEXT-FIG. 14. *Lanceola pelagica* Say, female. Inside view of the end of left antenna 1.

It is unfortunate after 57 years of recognition to have to discard Bovallius's name *sayana*, but if the law of priority is to be upheld it should be done. Say's specimen measured 1½ inches or about 32 mm. Bovallius gives the measurements as 30-42 mm. Stephensen (1918, p. 9, fig. 1) figures a male 27 mm. in length. The largest Bermuda specimen, which I believe to be an undeveloped female, measures 19 mm. I have figured the apex of antenna 1 which agrees very well with the figure given by Stephensen (1918, p. 9, fig. 1, A1 apex) except that the large antepenultimate joint appears to have a faint suggestion of segmentation, and the terminal seta of the narrow distal lower joint is much longer than is shown in his figure.

Lanceola loveni Bovallius.

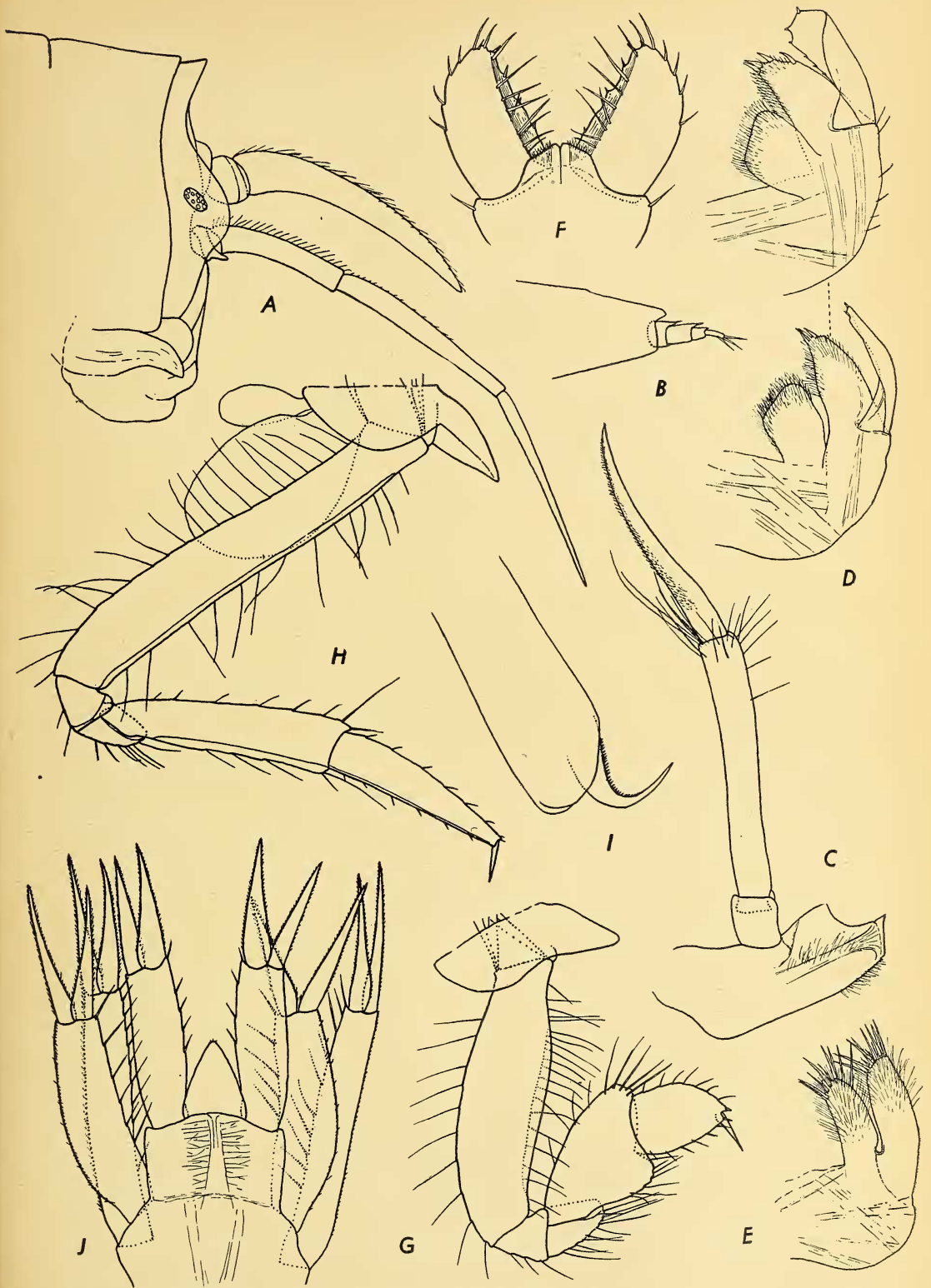
Text-figs. 15, 16 a-f.

Lanceola loveni Bovallius, 1885a, p. 6.

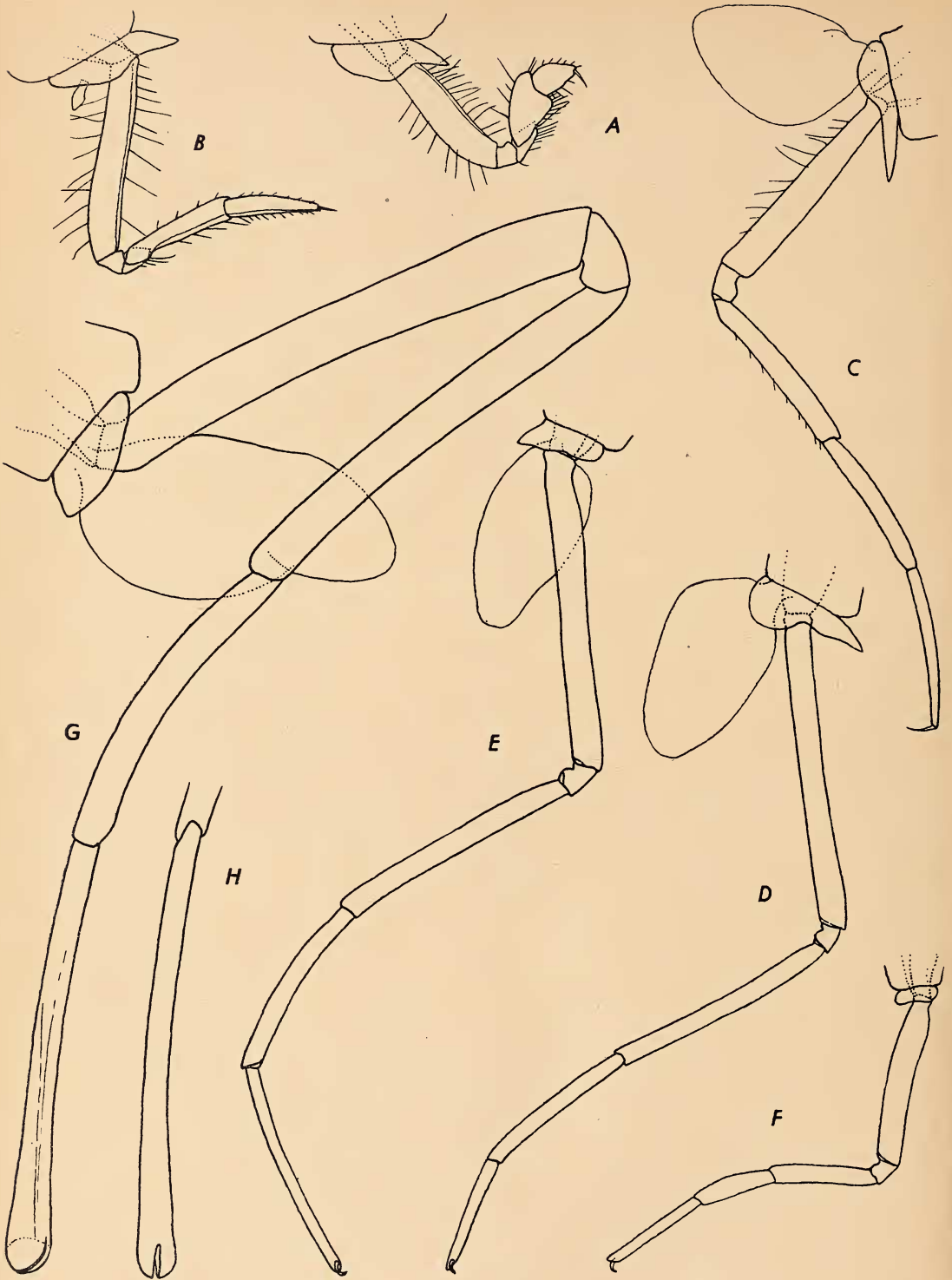
Lanceola loveni Bovallius, 1887a, p. 36, pl. 5, figs. 24-26; pl. 6, figs. 1-13.

Twenty-three specimens were taken at depths between 400 and 1,000 fathoms.

Distribution.—*Lanceola loveni* was described by Bovallius in 1885 from a single



TEXT-FIG. 15. *Lanceola loveni* Bovallius, male. **A**, head; **B**, end of antenna 1; **C**, mandible; **D**, maxilla 1; **E**, maxilla 2; **F**, maxillipeds; **G**, gnathopod 1; **H**, gnathopod 2; **I**, end of pereopod 4; **J**, uropods and telson.



TEXT-FIG. 16. *Lanceola loveni* Bovallius, male. A, gnathopod 1; B, gnathopod 2; C, peraeopod 2; D, peraeopod 3; E, peraeopod 4; F, peraeopod 5. *Lanceola loveni* var. *grossipes*, new var., female. G, peraeopod 4; H, sixth joint of peraeopod 4, front view.

specimen which was taken in the entrance to Davis Strait in 1843. The species has not appeared again until the present abundant material was procured at Bermuda by Dr. Beebe.

I have identified these specimens as *Lanceola loveni*, though they differ somewhat in detail from the description and figures given by Bovallius. The species was described from a single specimen, which, in my opinion, is always a more or less unsafe procedure, as there can be no certainty that the single specimen is a perfectly normal one. Variation in the relative length of the appendages appears to exist in the species of *Lanceola* and should be taken into consideration in their identification. The antennae and telson, as well as the peraeopods, are subject to relative variation in length, according to sex and size. The animals of this genus, and those of some of the other hyperiid genera, are inflated, bulky, transparent creatures, which with little handling become a limp misshapen mass of appendages, antennae, and integument. These facts naturally add to the difficulty of identifying these hyperiids.

The antennae are longer than shown by Bovallius (1887, pl. 6, fig. 1). The gnathopods resemble those figured by him, though they may be slightly longer. The peraeopods also resemble his figures except that peraeopod 3 (5 in his figures) is shorter in proportion to 4 (6 in his figures) than he has shown. Peraeopod 5 also is shorter in proportion to 4 than is shown by his figure. Peraeopod 4 has the broadly rounding apex to the sixth joint as Bovallius shows it. The uropods and telson agree with his figures. He states that the telson is less than half the length of the peduncle of the third pair of uropods and this statement holds good for the Bermuda specimens.

The largest female in the Bermuda collection measures about 21 mm., which is about the length of the type, which was a male. The largest male measures 15 mm. in length.

None of the females in the present collection possess fully developed marsupial plates and therefore do not appear to differ in appearance from the males.

***Lanceola loveni* var. *grossipes*,**
new variety.

Text-fig. 16 g, h.

Eight specimens were taken at depths between 600 and 1,000 fathoms.

This variety differs from the typical form only in the fourth and fifth peraeopods. The sixth joint of peraeopod 4 is distally thickened or expanded resembling a club. The joint is slit across the extremity for the reception of the strongly curved seventh joint when it is retracted. Peraeopod 5 appears to be only about one-third the length of peraeopod 4 which is about four-fifths the length of

the entire body. The length of the type female is 29 mm.

***Lanceola pacifica* Stebbing.**

Lanceola pacifica Stebbing, 1888, p. 1302, pls. 151, 152.

Lanceola pacifica var. *robusta* Woltereck, 1909, p. 160.

Fifteen specimens were taken at depths between 400 and 1,000 fathoms.

Distribution.—This species was described by Stebbing in 1888 from the western Pacific (35°41' N., 157°42' E.) from a single specimen which measured about 14 mm. (eleven-twentieths of an inch) in length. In 1904 Stebbing identified two specimens from the Bay of Biscay as this species, which were somewhat smaller than the type. Woltereck, in his meager description of his variety *robusta* from Albatross Station 4683, off southern Chile, gives no measurements, but in 1927, p. 64, he gives 27 mm. as the length of a female taken by the *Gauss* Expedition in the South Atlantic (0°46' N., 18°57' W.). Pirlet in 1929 recorded eight specimens taken by the *Armauer Hansen* in the vicinity of the Azores. Barnard in 1932 recorded fifteen specimens of *L. pacifica*, with which he included Woltereck's var. *robusta*, taken in the mid- and South Atlantic by the *Discovery*. His largest specimen, a female, measured 38 mm., while the largest in the present collection measures 30 mm. The specimens taken at Bermuda constitute the first records for this region.

***Lanceola serrata* Bovallius.**

Lanceola serrata Bovallius, 1885a, p. 7.

Lanceola serrata Bovallius, 1887a, p. 34, pl. 5, figs. 2-13.

Lanceola suhmi Stebbing, 1888, p. 1313, fig. 28.

Five specimens were taken at depths between 700 and 1,000 fathoms.

Distribution.—The most northern record is that given by Stephensen for specimens taken by the *Tjalfe* in Davis Strait (62°22' N., 55°48' W.). The most southern record is that of Barnard for specimens taken in the South Atlantic by the *Discovery* in 1926 (52°25' S., 9°50' E.). *L. serrata* has not been recorded outside of the Atlantic Ocean.

The present records are the first for Bermuda, but the specimens are all juvenile, the largest measuring about 16 mm. Bovallius gives 38 mm. as the length, but Barnard records a male from the South Atlantic 40 mm. in length.

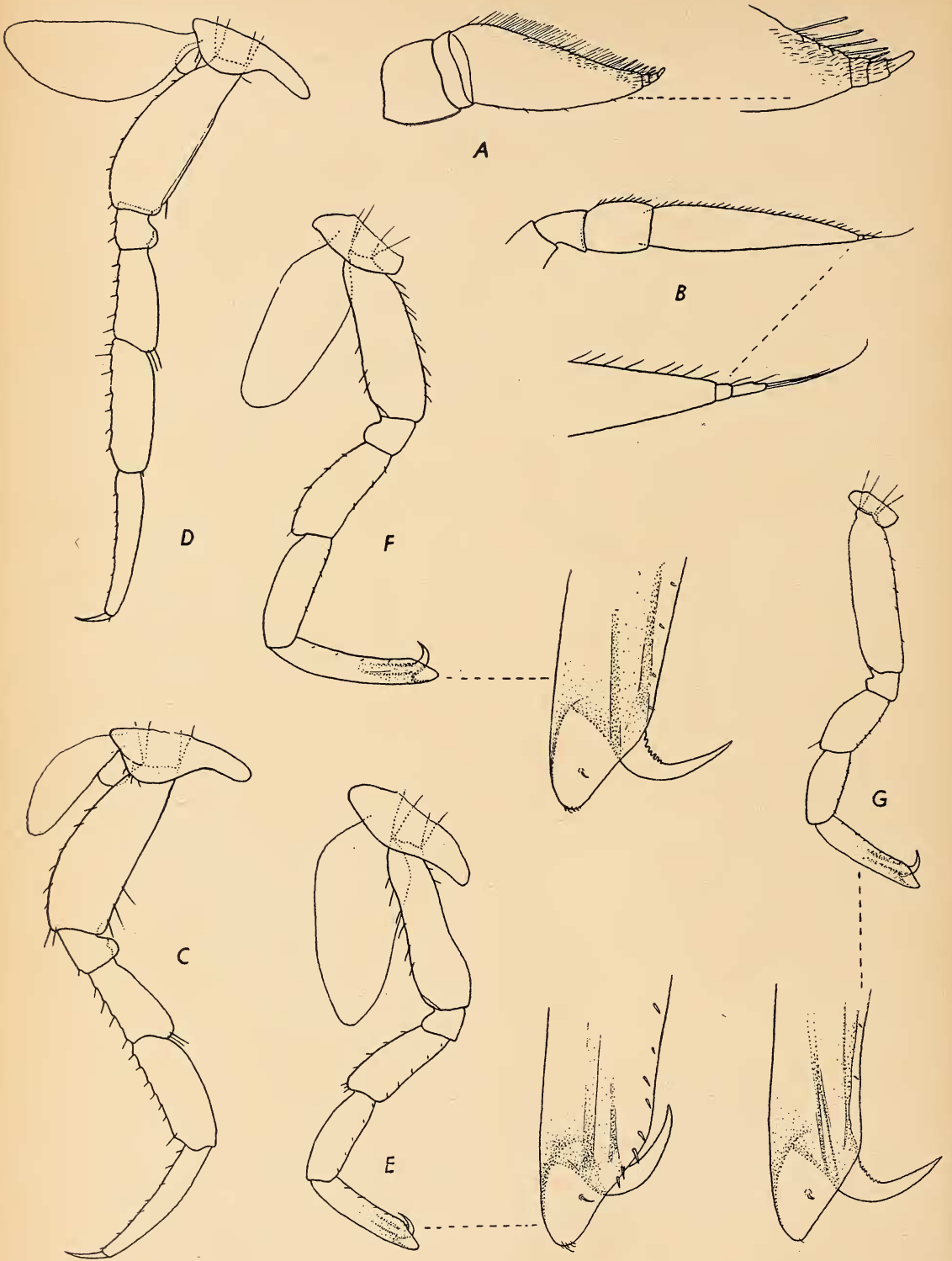
***Lanceola clausii* Bovallius.**

Text-figs. 17, 18.

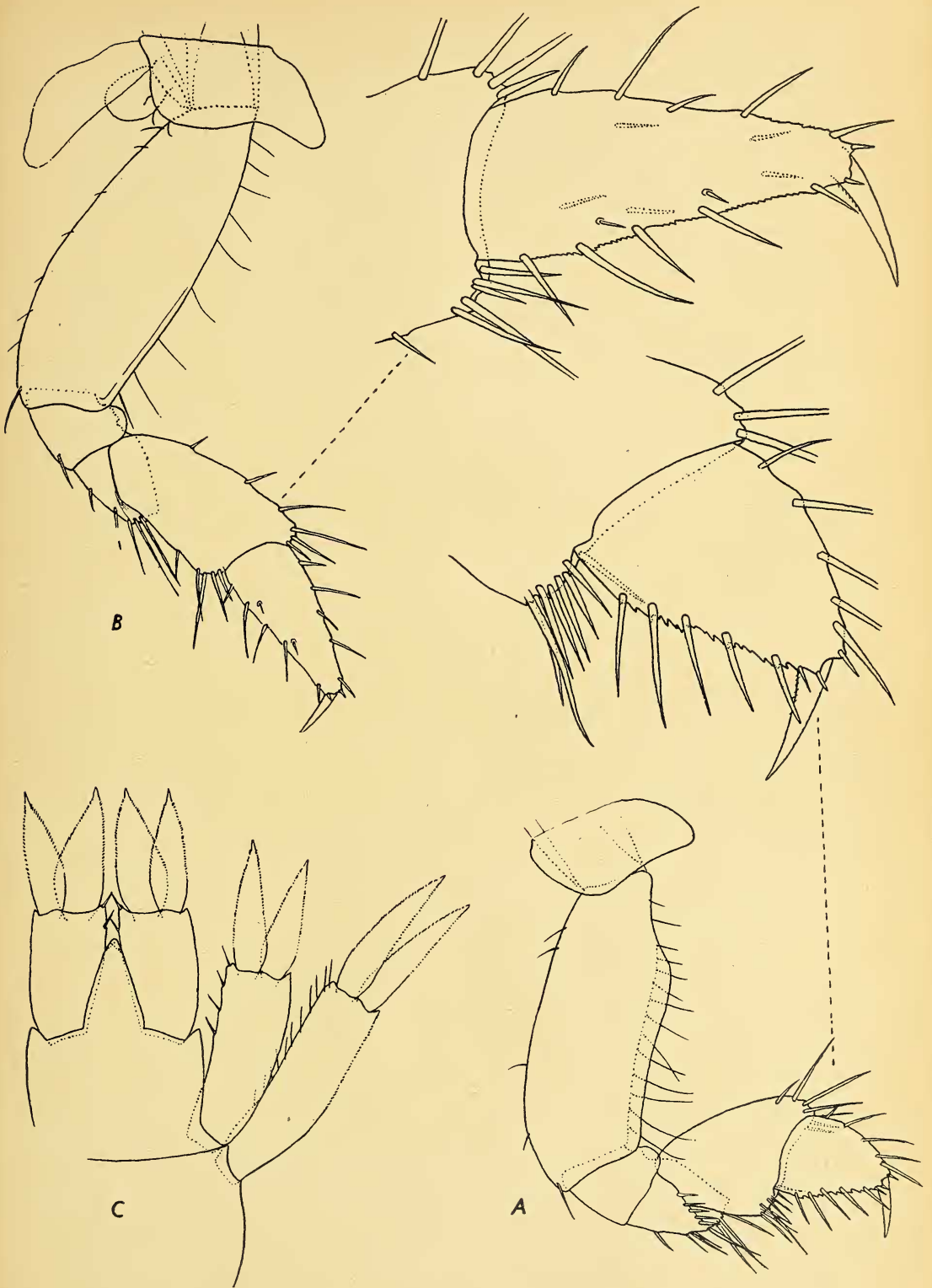
Lanceola clausii Bovallius, 1885a, p. 8.

Lanceola clausi Bovallius, 1887a, p. 40, pl. 6, figs. 14-23.

Lanceola clausi Sars, 1900, p. 15, pl. 1.



TEXT-FIG. 17. *Lanceola clausii* Bovallius, female. A, antenna 1; B, antenna 2; C, peraeopod 1; D, peraeopod 2; E, peraeopod 3; F, peraeopod 4; G, peraeopod 5.



TEXT-FIG. 18. *Lanceola clausii* Bovallius, female. A, gnathopod 1; B, gnathopod 2; C, uropods and telson.

Eight specimens were taken at depths between 700 and 1,000 fathoms.

Distribution.—This species was described by Bovallius from Baffin Bay (72° N.). Sars recorded it from 80° N., 134° E. and between 84° and 83° N., and between 25° and 11° E. Barnard records it from the Antarctic (71°41' S., 166°47' W.). Woltereck records it also from the Antarctic from specimens taken by the Deutsche Südpolar Exped. (65°3' S., 85°4' E.). This species has been taken in the Atlantic, and the Arctic and Antarctic Oceans but not in the Pacific. The present records are the first for Bermuda and also the first for the western North Atlantic.

Bovallius gives 20 mm. as the length of his specimen and Barnard records a specimen 19 mm. The specimens in the present collection are all immature, the largest measuring about 7 mm. None possess male sexual organs and some show partially developed marsupial plates. Although the specimens are immature they agree very well with the figures given by Bovallius and Sars. The peduncle of the first antenna is composed of three joints, the third, however, very short and rather difficult to observe. Second antenna with well-developed gland cone on second joint.

***Lanceola pirloti*, new species.**

Text-figs. 19, 20.

Six specimens were taken at depths between 700 and 1,000 fathoms.

Description of female.—Head very short and deep, upper front margin broadly angular and bent downward, but not at all projecting; side lobes rather bluntly angular with the small colorless oblique eye near the upper margin. Antenna 1 tumid and very broad horizontally, slightly longer than the second joint of gnathopod 1; the three peduncular joints plainly discernible, the first much the longest; the first flagellar joint very broad and fringed with sensory setae on inner margin, the three terminal joints short. Antenna 2 perhaps a little longer than antenna 1, first peduncular joint very large, second not in view except the gland cone, third short, fourth a little longer than the first three together and a little shorter than the fifth; flagellum about twice as long as fifth peduncular joint, the first joint very long and two terminal joints very short; inside margin of fourth and fifth peduncular joints and flagellum fringed with fine setae.

Gnathopod 1, coxal plate produced forward; second joint about two-thirds as wide as long; third and fourth joints short, fifth and sixth joints together nearly as long as second; fifth joint expanded distally and considerably wider than sixth; sixth joint shorter than fifth, with spines on upper and lower margins, palm slightly concave. Gnathopod 2 longer than 1, coxal plate produced

forward into a short lobe; second joint not expanded as much as that of gnathopod 1; fifth and sixth joints together about as long as the second; fifth joint moderately expanded distally and not much wider than sixth; sixth joint about equal in length to fifth, spines on upper and lower margins, palm slightly concave. The lower margins of the sixth joints of both gnathopods are serrate and the distal third of each is devoid of spines except for a rather small one near the distal end.

Peraeopods 1 and 2 short, stout, and much alike, coxal plate produced narrowly forward; second to fifth joints somewhat expanded; the fourth joint with the front margin strikingly convex. Peraeopods 3 to 5 not as stout as 1 or 2; peraeopod 4 the longest and 5 the shortest. In peraeopods 3 to 5 the distal extremity of the sixth joint which is produced beyond the dactyl is longer and not so obliquely truncate as is shown by Bovallius for *L. clausii* (1887, pl. 6, figs. 18-21). The dactyl of peraeopod 3 bears only a single small tooth on inner margin, but dactyl of peraeopods 4 and 5 bears several. The telson reaches beyond the middle of the peduncle of uropod 3. In uropod 3 the rami and the peduncle are subequal in length and the inner margin of the peduncle bears only a terminal spine. The female is about 13 mm. and the male about 11 mm. in length. The females appear to be immature, as only undeveloped marsupial plates are present. The body of the male is not so plump or distended as in the female, but the first antennae are noticeably broader and more tumid.

In general appearance this species is much like *L. clausii*, but there are characters which at once distinguish it from that species. The very broad second joint of gnathopod 1, the stout first and second peraeopods, and the relatively long fourth peraeopod are very striking.

***Megalanceola stephenseni* (Chevreux).**

Text-fig. 21.

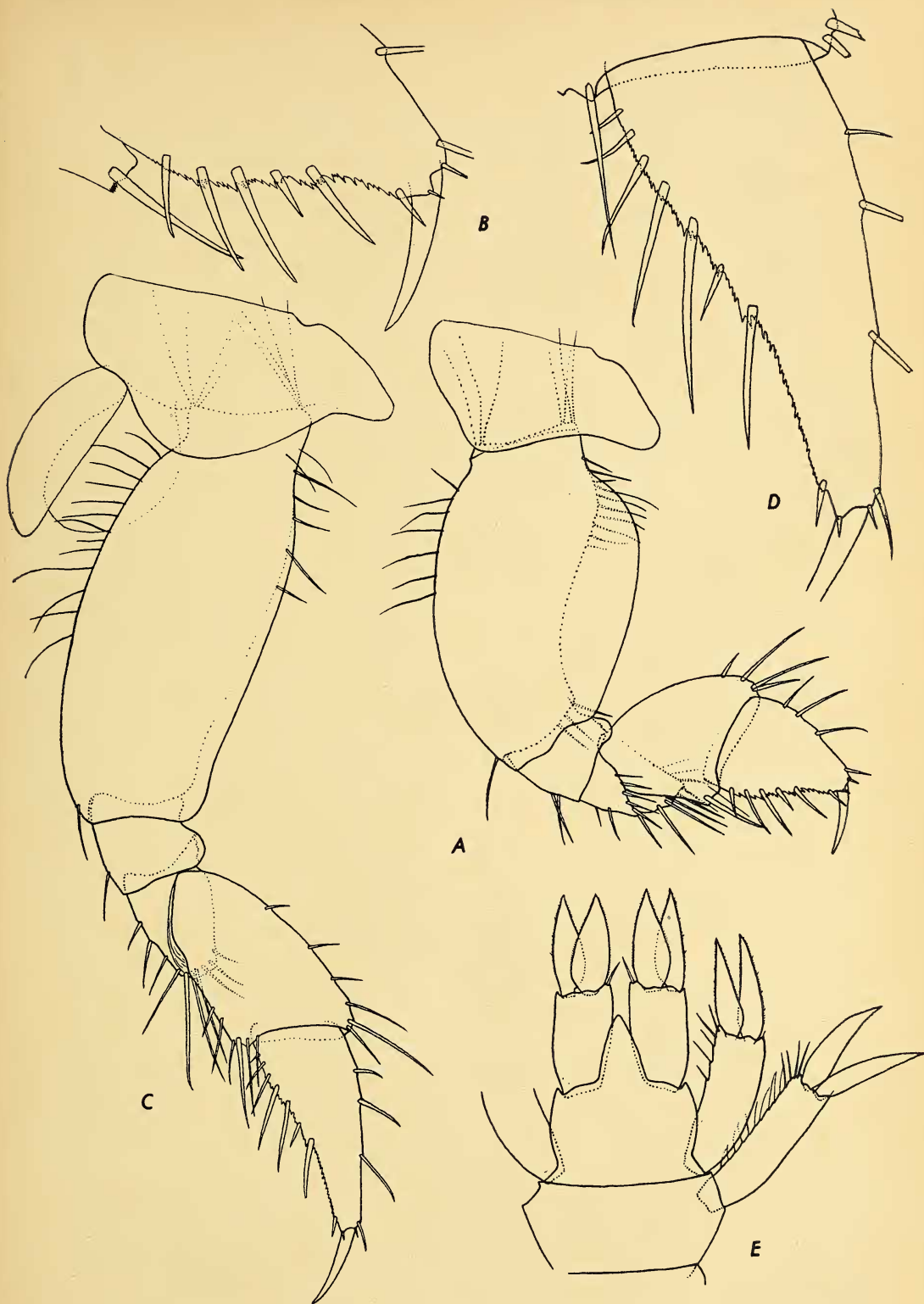
Lanceola stephenseni Chevreux, 1920, p. 4, figs. 1-3.

Megalanceola terrae-novae Pirlot, 1935, p. 2, figs. 1-4 ♀.

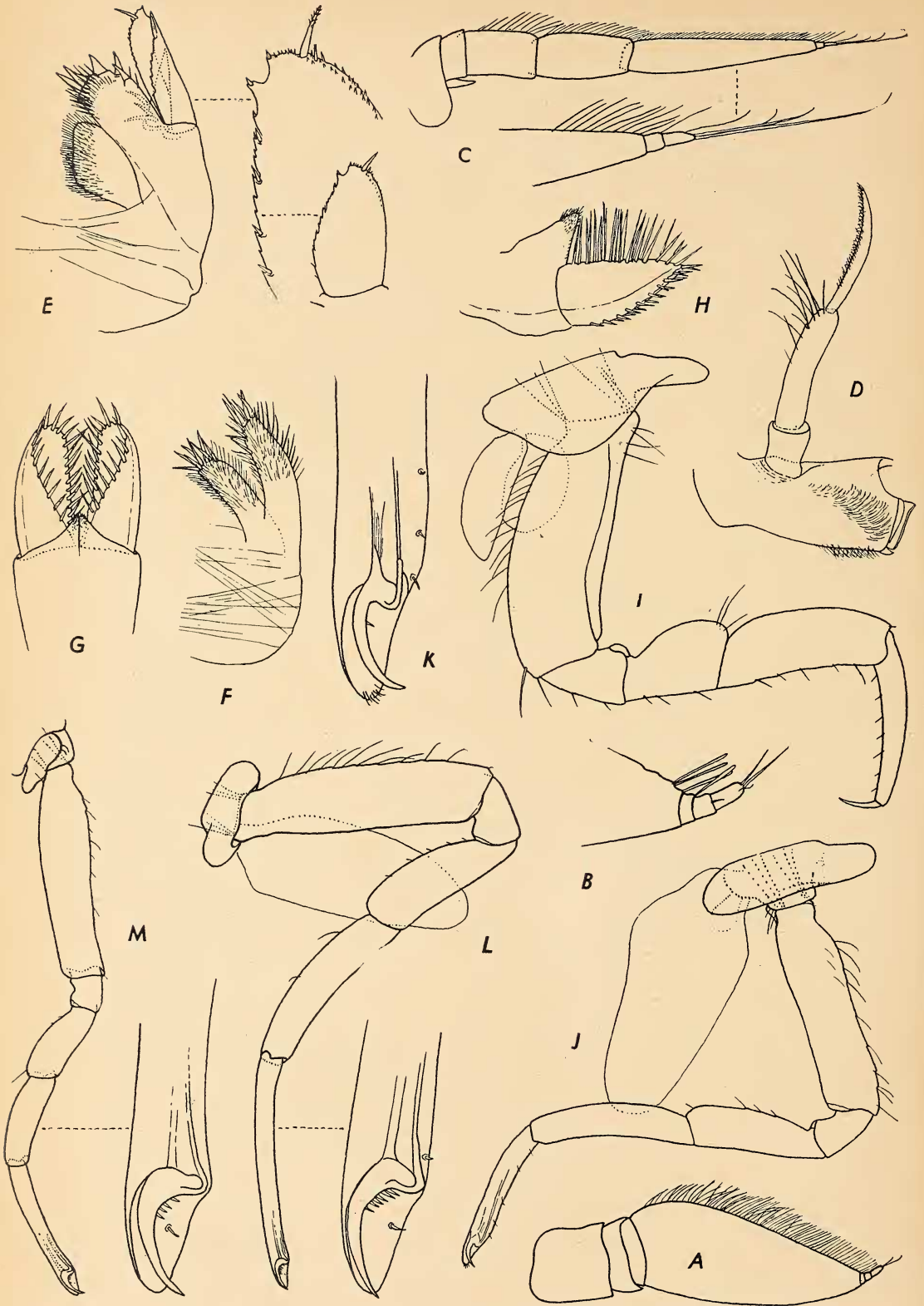
Megalanceola stephenseni Pirlot, 1939b, p. 9, pl. 1, figs. 1-4.

Eighteen specimens were taken at depths between 500 and 1,000 fathoms.

Distribution.—Pirlot, in 1935, p. 2, created the genus *Megalanceola* for a large female lanceolid which he named *Megalanceola terrae-novae*, and in 1939b, p. 9, he made his species a synonym of Chevreux's earlier species *Lanceola stephenseni*, but retained the genus *Megalanceola* for it. Chevreux's specimen, a female 12 mm. in length, was



TEXT-FIG. 19. *Lanceola pirloti*, new species, female. **A**, gnathopod 1; **B**, sixth and seventh joints of gnathopod 1; **C**, gnathopod 2; **D** sixth and seventh joints of gnathopod 2; **E**, uropods and telson.



TEXT-FIG. 20. *Lanceola pirloti*, new species, female. **A**, antenna 1; **B**, end of antenna 1; **C**, antenna 2; **D**, mandible; **E**, maxilla 1; **F**, maxilla 2; **G**, maxillipeds; **H**, maxillipeds, side view; **I**, peraeopod 1; **J**, peraeopod 3; **K**, end of sixth joint of peraeopod 3; **L**, peraeopod 4; **M**, peraeopod 5.

taken in the vicinity of the Azores (36°17' N., 28°53' W.), while Pirlot's specimen, a female 55 mm. in length, was taken at the Grand Bank of Newfoundland (43°26' N., 59°03' W.). In the present collection there are 1 male and 17 females. The largest specimen, a female, measures about 73 mm. in length, and the single male measures about 48 mm. in length and 14 mm. in width. Chevreux's specimen was undoubtedly very immature, but he thought it possible that it might be identical with the form cited by Stebbing as *Lanceola* species of his *Challenger* report (1888, p. 1308, fig. 27). The drawings accompanying Stebbing's remarks were made by Willemoes Suhm, and, though rather crude, leave little doubt that the specimen was the same as Chevreux's *Lanceola stephenseni*. The specimen was taken off the Banda Islands in the Banda Sea and, according to Stebbing, measured about 2 inches or about 50 mm. Stebbing says that the figure represents the specimen in a bent position, but this is apparently the normal position of the body, as all the specimens in the present collection have this position. The male, however, is not so much bent as the female. It is difficult to determine the best way of measuring an animal in this bent position, but I have measured from the farthest point in the bend of the body, which would usually be the dorsal surface of the second or third thoracic segment, straight across to the apex of the longest uropod. This distance in the largest specimen is about 73 mm.

The *Challenger* specimen, having been taken in the Banda Sea, indicates a very wide distribution for this species.

The eye in the present specimens is not conspicuous, but is of the same shape and size as figured by Willemoes Suhm and not oval, as figured by Chevreux. In the *Challenger* figure there is a very decided and abrupt narrowing of the proximal end of the second joint of peraeopods 1-5. In the Bermuda specimens, as in Chevreux's, this character is present only on peraeopods 3-5 and is most pronounced on peraeopod 3, where the angle is produced decidedly forward. Pirlot (Les Amphipodes de l'Expédition du Siboga; première partie, Les Amphipodes Hyperides, 1930, p. 3), thinks that Willemoes Suhm's figure probably represents *Lanceola sayana*, but in *L. sayana* the eye is small and placed higher up, and the fourth peraeopod is much longer than either the third or fifth. In *M. stephenseni* the eye is large and occupies the entire lateral angle which is placed much lower on the front margin of the head than in *L. sayana*. The fourth peraeopod in *M. stephenseni* is a little shorter than the third and only a little longer than the fifth.

***Metalanceola chevreuxi* Pirlot.**

Metalanceola chevreuxi Pirlot, 1931, p. 1, figs. 1-3.

Metalanceola chevreuxi Pirlot, 1939b, p. 13, figs. 6-8.

One specimen was taken at a depth of 1,000 fathoms.

Distribution.—The only specimen of this species heretofore recorded is the one described by Pirlot from west of the Madeira Islands (31° 06' 00" N., 24° 06' 45" W.).

Pirlot's specimen measured about 4 mm. from the front of the head to the bend of the abdomen. The present specimen measures about 8 mm. from the front of the head to the end of the uropods when the abdomen is in a straight line with the thorax, which would make it about the same size as his specimen. From the lack of marsupial plates Pirlot believed his specimen to be an immature male. The present specimen has partially developed marsupial plates on the second gnathopod and the first three peraeopods, and branchiae on the second, third and fourth peraeopods. These characters and the complete absence of male sexual appendages indicate that the specimen is an undeveloped female.

This specimen agrees exceedingly well with Pirlot's figures. The short stout legs with their large hook-like dactyls point, as Pirlot believed, to a parasitic mode of life. It is probably a very deep water species, as Pirlot's specimen came from a depth of 0-5,000 meters and the Bermuda specimen from 0-1,829 meters.

***Scypholanceola vanhoeffeni* Woltereck.**

Text-fig. 22.

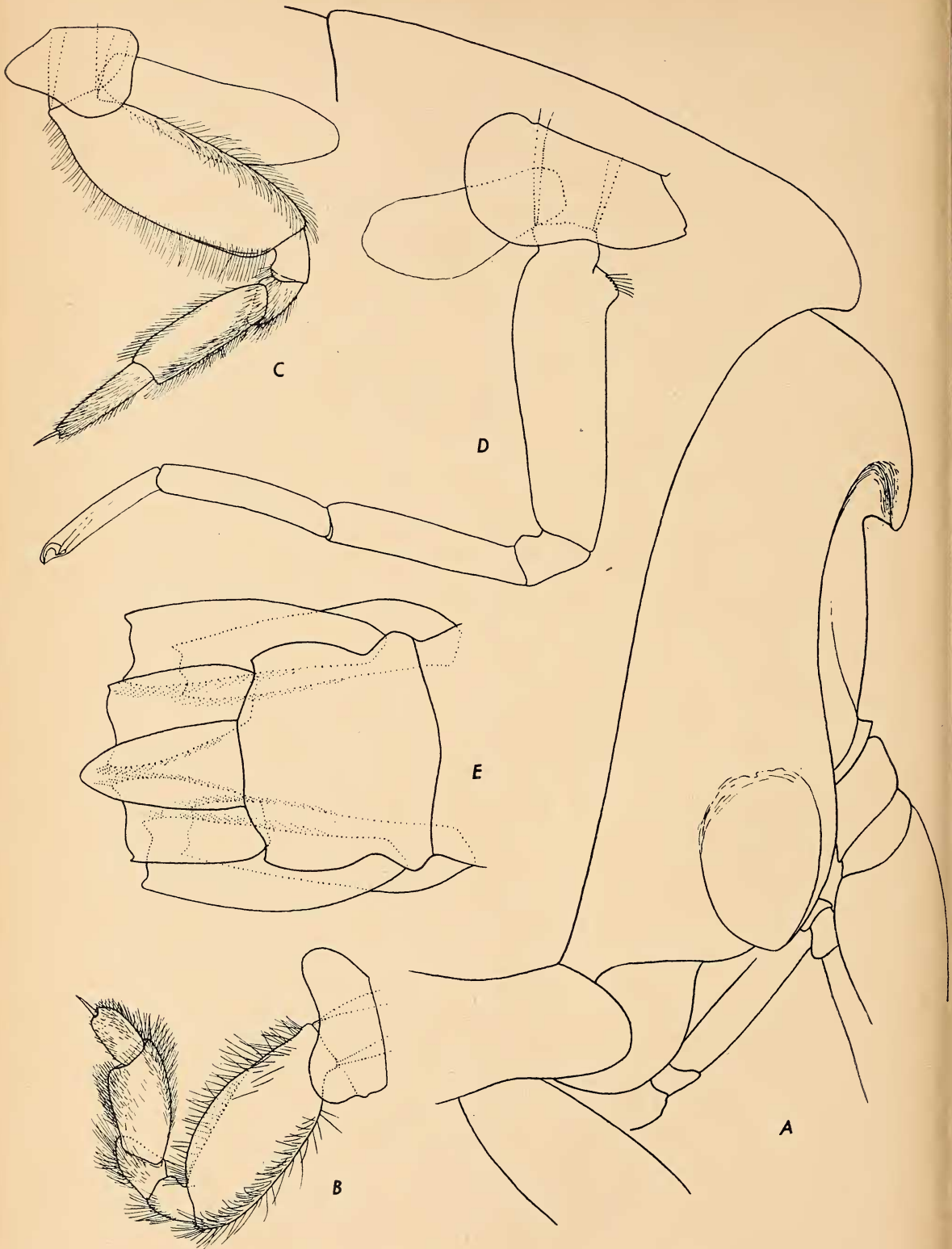
Scypholanceola vanhoeffeni Woltereck, 1909, p. 161, pl. 7, figs. 24a ♂, 24b ♀.

Scypholanceola vanhoeffeni Woltereck, 1927, p. 65, figs. 5a-b, 9.

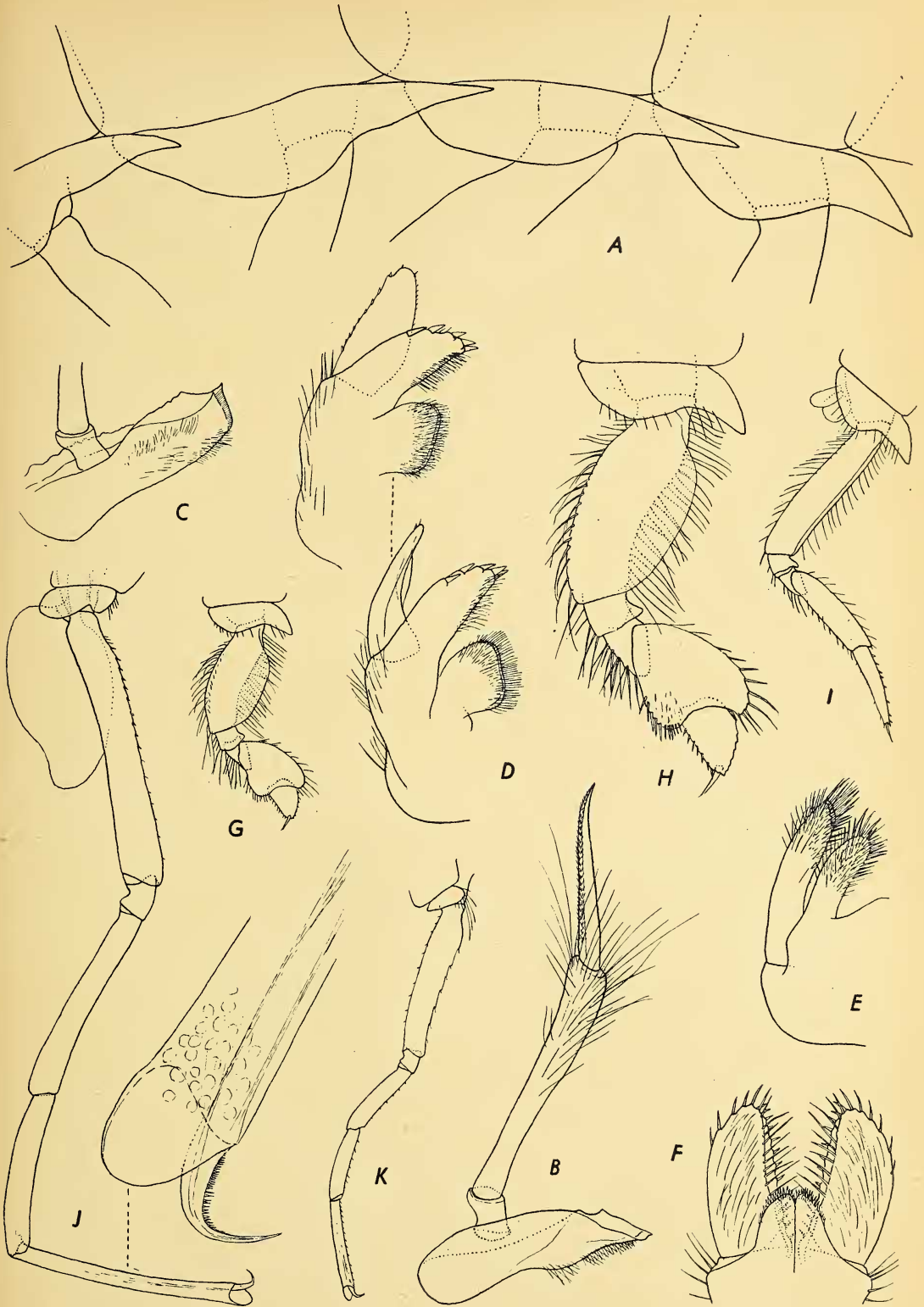
Forty-one specimens, male and female, were taken between 500 and 1,000 fathoms.

Distribution.—*Scypholanceola vanhoeffeni* was taken by the *Gauss* Expedition in the Antarctic (64° 29' S., 85° 27' E.) and the tropical Atlantic (12° 11' S., 6° 16' W.). By the *Valdivia* it was taken in the Indian Ocean (5° 42' S., 43° 36' E.). Barnard recorded it off Cape Point, Union of South Africa, in 1916, and in 1932 from the east mid-Atlantic and the Southeast Atlantic. The present specimens from Bermuda are the first from the western North Atlantic.

Woltereck (1927) and Barnard (1932) believed that *Scypholanceola richardi* Chevreux should be united with *vanhoeffeni*, and Barnard at the same time raised the question whether *Scypholanceola chuni* Woltereck should not also be regarded as a synonym of *vanhoeffeni*. Pirlot (1939b) regards *vanhoeffeni*, *chuni* and *richardi* as synonyms, but is doubtful about *Scypholanceola agassizi* Woltereck, which is insufficiently described. Until the status of *agassizi*, which was taken by the *Albatross* off Peru in



TEXT-FIG. 21. *Megalanceola stephenseni* (Chevreux), male, **A**, head; **B**, gnathopod 1; **C**, gnathopod 2; **D**, pereopod 3; **E**, uropods and telson.



TEXT-FIG. 22. *Scypholanceola vanhoffeni* Woltereck, male. A, coxal plates 2-5; B, C, mandible; D, maxilla 1; E, maxilla 2; F, maxillipeds; G, H, gnathopod 1; I, gnathopod 2; J, peraeopod 4; K, peraeopod 5.

1904, can be determined, *vanhoeffeni* must be regarded as the type of the genus, as it is mentioned by Woltereck (1909) on page 161, whereas *chuni* is not mentioned until page 162, and, as Barnard has already observed (1932, p. 257), Woltereck's figure in his 1905 paper (p. 415, fig. 2) is clearly that of *vanhoeffeni*.

If *S. richardi* be accepted as a synonym of *S. vanhoeffeni* the range will be extended in the Atlantic to 46° north latitude.

The *Valdivia* obtained a female of *S. vanhoeffeni* 36 mm. in length from the Indian Ocean. The largest specimen in the present collection, a female, measures 41 mm. Woltereck (1927, p. 68) states that a female of *S. chuni* measuring 61 mm. is the largest lanceolid known. *S. vanhoeffeni* then becomes the largest lanceolid, as *S. chuni* is believed by Pirlot to be a synonym of it.

S. vanhoeffeni is easily recognized by the peculiar fold of the integument through the eye. The thorax is swollen, cylindrical, and filled with transparent liquid except for a large mass of purplish material, posterior to which is a smaller white mass. The head and the first two mesosome segments show a slight mid-dorsal angle which disappears on the following segments until the fifth where it begins to show again slightly, becoming more and more noticeable toward the first metasome segment where it ceases. The head is as figured by Woltereck (1909, pl. 7, fig. 24a, ♂, 24b ♀). I have figured the coxal plates, the mouth parts and some of the mesosome appendages. It will be seen that they agree very closely with the figures given by Chevreux (1920, pp. 9, 10, figs. 5, 6) for *S. richardi*.

The sexes appear to be very much alike, but the males can be distinguished from the immature females by the presence of the two tubercles on the ventral side of the seventh segment, which bear the external openings of the seminal ducts, though the ducts themselves have, in most specimens, disappeared entirely.

FAMILY MICROPHASMIDAE.

Microphasma agassizi Woltereck.

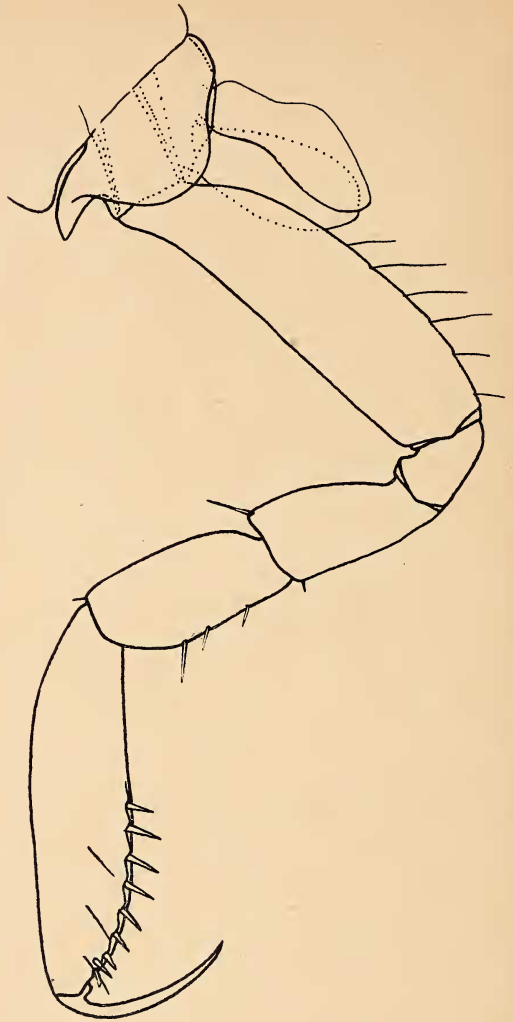
Text-fig. 23.

Microphasma agassizi Woltereck, 1909, p. 153, pl. 4, fig. 11.

Microphasma agassizi Stephensen and Pirlot, 1931, p. 539, figs. 15, 16.

Fifteen specimens, most females, were taken between 800 and 1,000 fathoms.

Distribution.—This genus and species were described by Woltereck from a single specimen taken by the steamer *Albatross* at Station 4663, off Peru. In 1929 Pirlot recorded a specimen which was taken by the *Armauer Hansen* off the Madeira Islands (30° 14' N., 19° 38' W.). In 1939 he recorded two specimens taken on the ex-



TEXT-FIG 23. *Microphasma agassizi* Woltereck. Pereopod 1.

peditions of the Prince of Monaco, 1904, 1905, in the vicinity of the Madeira Islands and the Azores, and one specimen taken on the expedition of 1910 in the Gulf of Gascony. Up to the present time these five specimens were all that had been recorded. Now the exploration of the waters at Bermuda by Dr. Beebe has brought from the ocean depths fifteen additional specimens of this rare hyperiid.

The males and females have very much the same appearance, but the males can be distinguished by the first antenna which is larger and thicker than in the female. The body in both sexes is tumid and very much arched as shown by Woltereck (1909, pl. 4, fig. 11). In the present specimens and in the specimen figured by Stephensen and Pirlot (1931, p. 542, fig. 16), the fifth joint of pereopods 1-3 (pereopods 3-5 of S. &

P.) is longer in proportion to the sixth joint than is shown in Woltereck's figure.

In the present collection the largest female measures 7 mm. from the end of the uropods to the farthest point of the arch of the body, and the male measures 6 mm.

FAMILY MIMONECTIDAE.

Mimonectes sphaericus Bovallius.

Text-fig. 24.

Mimonectes sphaericus Bovallius, 1885b, p. 11, pl. 2, fig. 12 ♀.

Mimonectes sphaericus Bovallius, 1889, p. 66, pl. 6, figs. 1-10 ♀.

Sphaeromimonectes valdiviae Woltereck, 1904; p. 621, fig. 1 ♀.

Sphaeromimonectes valdiviae pacifica Woltereck, 1909, p. 148, pl. 2, fig. 6 ♂, + *S. valdiviae*, pl. 2, fig. 7 ♀.

Sphaeromimonectes valdiviae Woltereck, 1927, p. 82, figs. 23 ♂ and ♀, 24b, 25b.

Mimonectes sphaericus Stephensen and Pirlot, 1931, p. 516, figs. 5, 6 ♀.

One specimen was taken at a depth of 600 fathoms.

Distribution.—The female described by Bovallius was 15 mm. in length and was taken in the Atlantic near the Canary Island, 28° N., 21° W. The female figured by Stephensen and Pirlot (1931, p. 517, figs. 5, 6) in the possession of the Copenhagen Museum is 17-18 mm. in length and was taken off the Bay of Biscay 46° N., 18° W. It has been recorded by Behning from Bering Sea. The present record is the first from the Bermuda region.

The single specimen in this collection is about 10 mm. in length and appears to be an immature male. The sexual organs are not developed, but the long first antennae and the undeveloped second antennae which extend just beyond the peduncles of the first antennae indicate that it is a male. Rudimentary marsupial plates are present as they are in the immature males of *M. gaussi*.

The male of *M. sphaericus* has not been described and I am of the opinion that the male of *Sphaeromimonectes valdiviae pacifica* Woltereck is the male of *M. sphaericus* Bovallius.

The present specimen bears a rather close resemblance to the figure of *Sphaeromimonectes valdiviae pacifica* ♂ Woltereck (1909, pl. 2, fig. 6), though the body is somewhat more arched anteriorly. His figure is rather diagrammatic and shows little detail; the gnathopods, therefore, may be more spinose than he has shown, or this may be a variable character. In the present specimen the second and sixth joints of the first gnathopod are three-sided, the top or front margin being flat and the two sides converging to the rounding lower or hind margin. This character is present also in the second gnathopod, but is not so strongly

developed. The relative lengths of the gnathopods and peraeopods and the proportions of the respective joints are very much the same in the present specimen as in the male of *S. valdiviae pacifica* figured by Woltereck, and as figured by Stephensen and Pirlot for the female of *M. sphaericus* (1931, p. 518, fig. 6).

The figures of the female of *S. valdiviae* given by Woltereck (1904, p. 623, fig. 1; 1909, pl. 2, fig. 7; 1927, p. 82, fig. 23a) appear not to differ materially from the figures of *M. sphaericus* given by Stephensen and Pirlot (1931, p. 517, fig. 5).

In the present specimen the first antennae are of the same proportions as figured by Woltereck for *S. valdiviae pacifica*. The long first antennary joint bears the armament of setae as shown by Woltereck and the three short terminal joints are as he has figured them. The second antennae are as figured by him, but are perhaps not quite so long. He states that the maxillipeds of *M. v. p.* possess a rudimentary palp. The outer plate of the left maxilliped in the present specimen bears a tubercle surmounted by a seta which appears to represent the rudimentary palp, but the right plate presents only a slight hump bearing a seta. Too much importance should not be placed on the proportions of a rudimentary organ, and it may well be that this rudimentary palp is not always present.

The gnathopods are as I have figured them. The proportions of the first gnathopod are practically as figured by Woltereck (1909, pl. 2, fig. 6) and they are also much as figured by Stephensen and Pirlot (1931, p. 518, fig. 6, pl. p2) for the female of *Mimonectes sphaericus*. The peraeopods are slender. Peraeopod 1 is slightly longer than peraeopod 2. Peraeopod 3 is the longest. Peraeopod 4 is shorter than either 1 or 3 and is the slenderest of all. Peraeopod 5 is a little shorter than 4 but stouter. The uropods and telson are as figured by S. & P. for *M. sphaericus* (1931, p. 517, fig. 5 uros.) except that the inner margins of the peduncles of all the uropods bear a few spines.

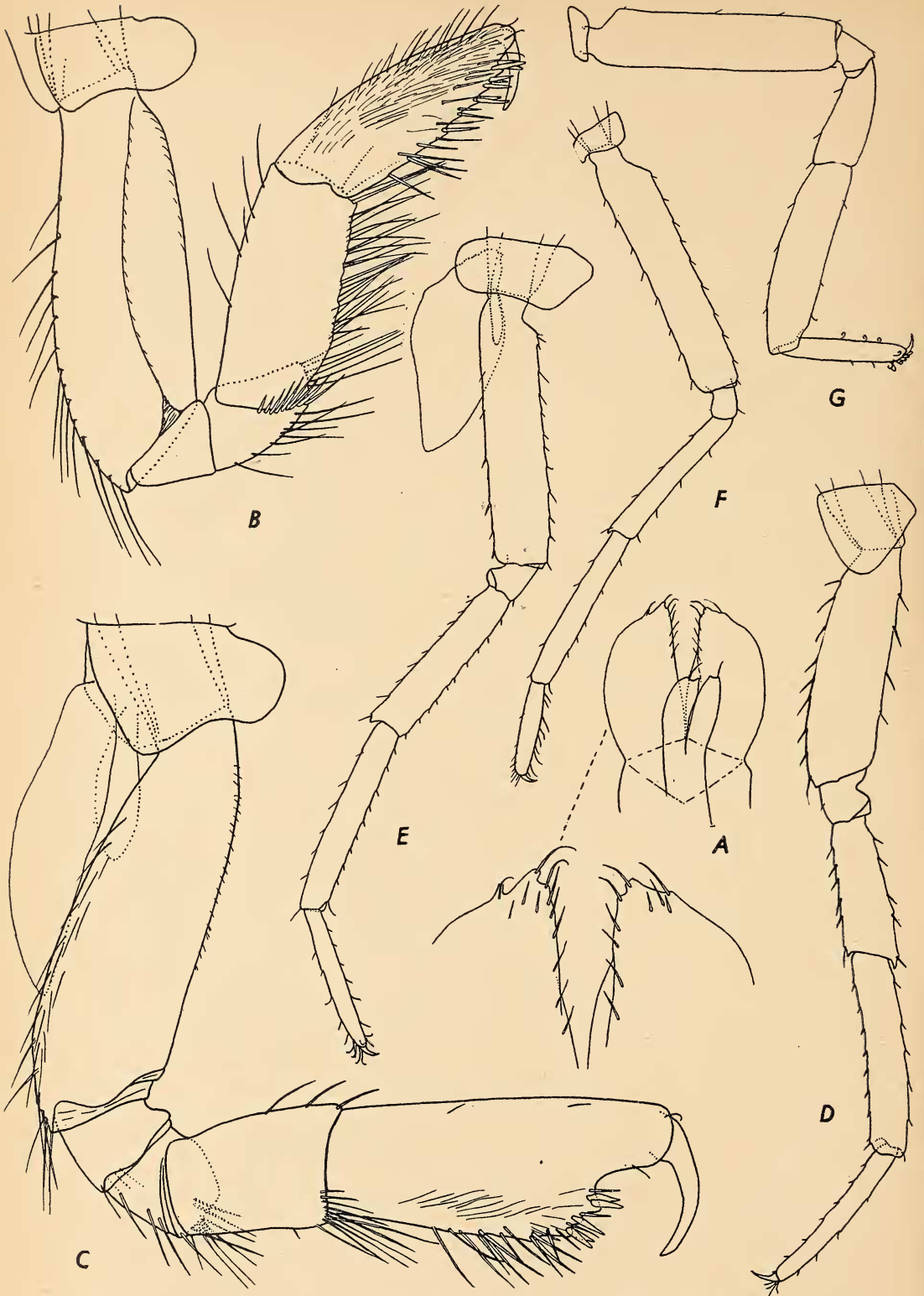
In the genus *Mimonectes*, where the degree of tumidity of the body varies with the development, the proportions of scarcely any two specimens are exactly alike. This, with the difference in appearance of the fully developed males and females, has, in my opinion, led to the describing of the males and females of the same species as different species, and also the females of the same species as different species.

Mimonectes loveni Bovallius.

Text-fig. 25.

Mimonectes loveni Bovallius, 1885b, p. 3, pl. 1, pl. 2, figs. 15-20, pl. 3.

Mimonectes loveni Bovallius, 1889, p. 60, pl. 5.



TEXT-FIG. 24. *Mimonectes sphaericus* Bovallius, male. **A**, maxillipeds; **B**, gnathopod 1, young; **C**, gnathopod 2, young; **D**, peraeopod 1; **E**, peraeopod 3; **F**, peraeopod 4; **G**, peraeopod 5.

Sphaeromimonectes cultricornis Woltereck, 1906, p. 868, fig. 5a.

Sphaeromimonectes cultricornis Woltereck, 1927, p. 83, figs. 25a, 26.

Parascina chevreuxi Pirlot, 1929a, p. 56.

Fifteen specimens were taken at depths between 500 and 1,000 fathoms.

Distribution.—This species has been recorded south of Iceland and down the eastern North Atlantic to the Azores and Madeira; in the South Atlantic it has been recorded from the Gulf of Guinea; in the Pacific it has been taken in the East Indies; and Barnard has reported it from the Arabian Sea. It is now recorded from Bermuda.

Pirlot (1939, p. 20) has made *Mimonectes chevreuxi* the male of *Mimonectes loveni* Bovallius. The Bermuda material contains both sexes. Most of the females range between 5 and 13 mm. in length and they do not exhibit the globular form shown by Bovallius (1885, pl. 1, fig. 1) but have much the appearance of the figure given by Woltereck of *Sphaeromimonectes diomedea* (1909, pl. 3, fig. 8). As the female increases in size to maturity, it gradually assumes

the spherical form shown by Bovallius, who states that the females measure from 18–28 mm. in length.

There is in the Bermuda material one large female about 24 mm. in length which is deflated and limp, but which undoubtedly originally had a spherical shape like the female figured by Bovallius. Another female about the same size shows very well the spherical shape.

In the immature females antenna 1 is about as long as the first two or three body segments combined, and antenna 2 is very short, not reaching to the end of the peduncle of antenna 1.

A male 13 mm. in length, which appears to be the largest male yet recorded, in shape and general appearance very much resembles Woltereck's figure of *Sphaeromimonectes diomedea*. The length to which the male grows or the form it finally assumes is not known, but the present specimen has the sexual organs well or perhaps fully developed, so it may be a fully developed specimen. Antenna 1 in this specimen is nearly as long as the mesosome and the inside surface is densely clothed with long, simple setae, which are longest proximally and gradually become shorter until at the apex they are very short.

The peraeopods appear to be proportionately somewhat longer in the male than in the female, and peraeopod 3 (peraeopod 5 of Stephensen and Pirlot) is noticeably stouter and longer than peraeopod 4 or 5.

Mimonectes gaussi (Woltereck).

Text-figs. 26, 27.

Sphaeromimonectes gaussi Woltereck, 1904, p. 627 (female).

Parascina fowleri Stebbing, 1904, p. 21, pl. 2B (immature).

Sphaeromimonectes gaussi Woltereck, 1906, p. 867, fig. 4 (female).

Sphaeromimonectes diomedea Woltereck, 1909, p. 148, pl. 3, fig. 8 (male).

Sphaeromimonectes gaussi Woltereck, 1927, p. 80, figs. 18–22 (female).

Mimonectes fowleri Stephensen and Pirlot, 1931, p. 519, figs. 13, 115, VII–X.

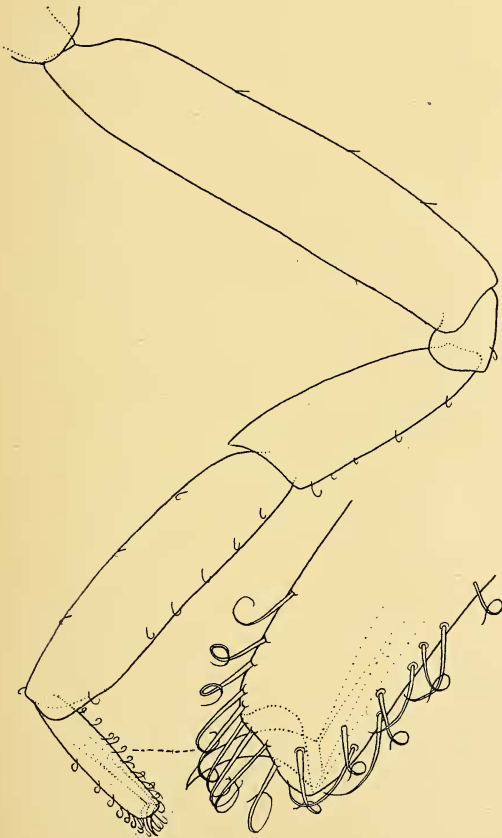
Mimonectes gaussi Stephensen and Pirlot, 1931, p. 531.

Mimonectes diomedea Stephensen and Pirlot, 1931, p. 531.

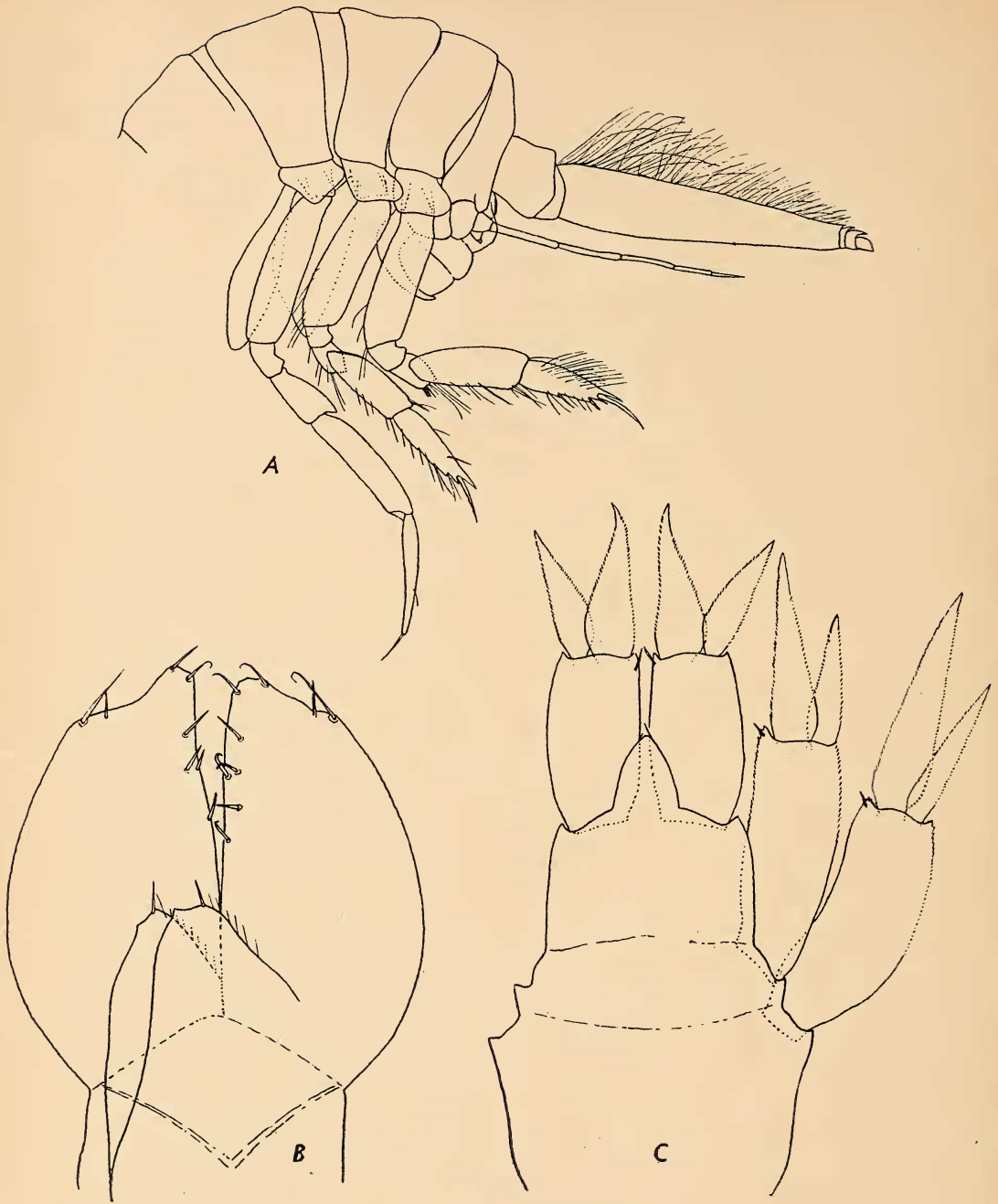
Twenty-nine specimens were taken at depths between 500 and 1,000 fathoms.

Distribution.—Davis Strait; south of Iceland; north of the Hebrides; Gulf of Gascony; coast of Portugal; Madeira Islands; southeast Atlantic (off South Africa, Barnard); off Peru (*S. diomedea*, Woltereck); and it is here recorded from Bermuda.

Sphaeromimonectes gaussi Woltereck described from the coast of Portugal, *Para-*



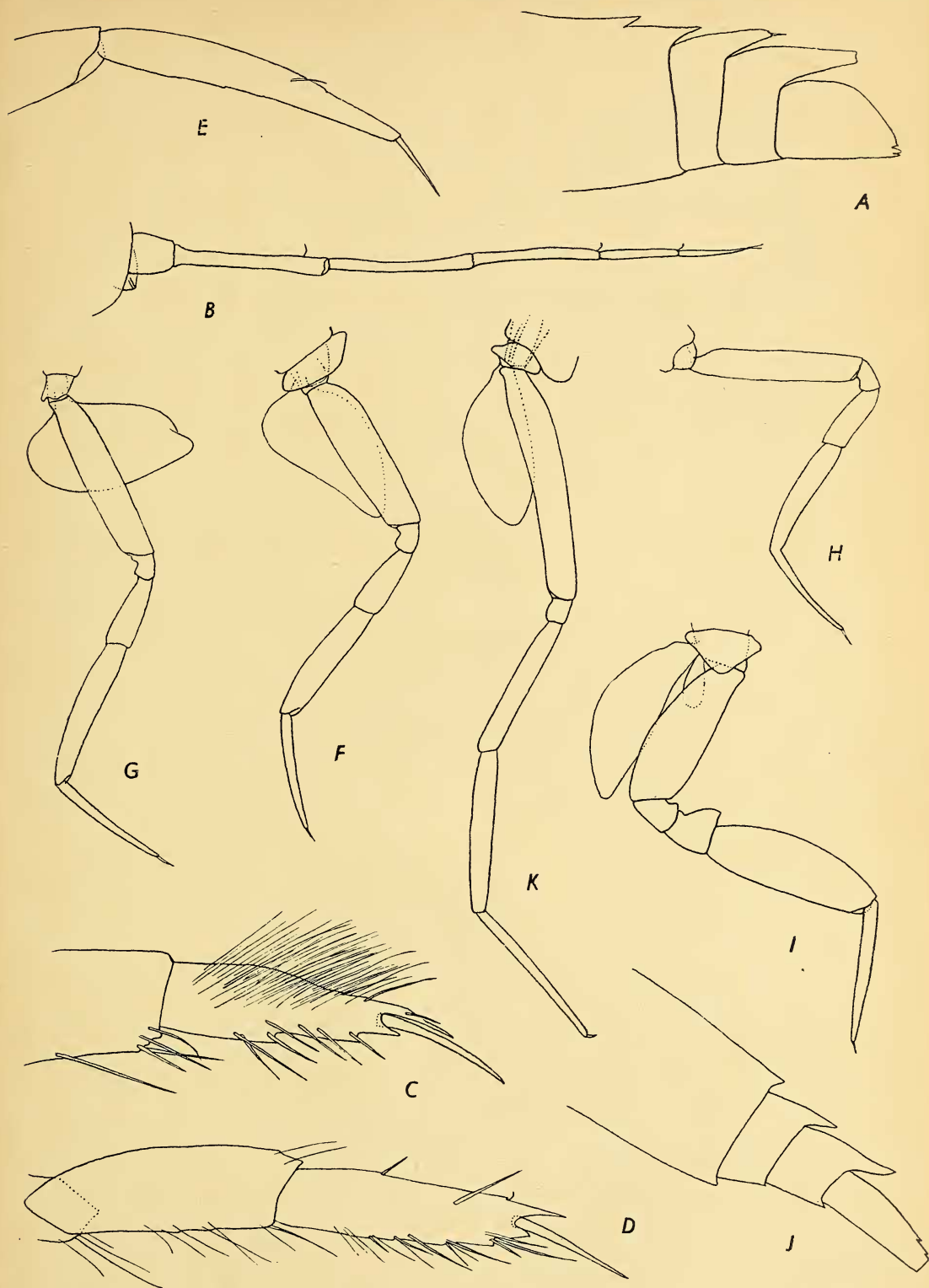
TEXT-FIG. 25. *Mimonectes loveni* Bovallius, female. Peraeopod 5.



TEXT-FIG. 26. *Mimonectes gaussi* (Woltereck), male. 9 mm. in length, **A**, anterior end of animal; **B**, maxillipeds; **C**, uropods and telson.

scina fowleri Stebbing described from the Gulf of Gascony, and *S. diomedea* Woltereck described from the coast of Peru appear to me to be one and the same species. As Woltereck's name has priority, the species will have to bear the name *Mimonectes gaussi*, as both *Sphaeromimonectes* and *Par-*

ascina are now regarded as synonyms of *Mimonectes* Bovallius. The original description of *S. gaussi* (1904, p. 629) is very short and superficial and is inadequate for identifying the species, but the figure of the original female given by Woltereck (1906, p. 867, fig. 4) is good and presents the



TEXT-FIG. 27. *Mimonectes gaussi* (Woltereck), male, 9 mm. in length, A, end of antenna 1; B, antenna 2; C, gnathopod 1; D, gnathopod 2; E, end of peraeopod 1; F, peraeopod 3; G, peraeopod 4; H, peraeopod 5; male, 6 mm. in length, I, peraeopod 1; male, 7.5 mm. in length, J, end of antenna 1; K, peraeopod 4.

specific characters very well. Woltereck's specimen was a fully developed female measuring 18 mm. in length, while the specimen of *Parascina fowleri* figured and described by Stebbing measured only 8 mm. from the apex of first antenna to the end of the uropods and was small and immature. The sex of Stebbing's specimen is not stated, probably for the reason that it is scarcely possible to distinguish the sex of small immature specimens.

Woltereck's figures of the peraeopods (1927, p. 81, fig. 20), while rather lacking in detail, show very distinctly the pointed apical processes of the sixth joint of the first and second gnathopods. Stephensen and Pirlot (1931, p. 531) noted several points of agreement between *M. gaussi* and *M. diomedae*, and between *M. diomedae* and *M. fowleri*, but they did not seem inclined to regard these three species as synonymous. Pirlot (1939, pp. 23, 24) makes *M. spandli* a questionable synonym of *Mimonectes gaussi*, but as the sixth joints of the gnathopods of *M. spandli* do not possess the characteristic apical processes of *M. gaussi*, I am retaining them as separate species, awaiting further evidence. Woltereck (1927, p. 81) states that in the female of *M. gaussi* the femora (second joints) of the peraeopods are broad, and Stephensen and Pirlot have figured the appendages of the female of *M. fowleri* (1931, p. 525, fig. 9) as possessing this character.

I have figured a male specimen 9 mm. in length from the front of the head to the end of the uropods, possessing fully developed sexual organs and second antennae two-thirds the length of the first antennae. This specimen appears to be fully developed, and the gnathopods and peraeopods are proportionately longer and slenderer than in the female and their second joints are very slightly expanded.

The characters of this species vary considerably with sex and size. The mature and fully grown females attain a greater size than the fully developed males and as the female reaches maturity the fore part of the mesosome becomes greatly arched and swollen. Young males with the sexual organs partially developed have also partially developed marsupial plates and closely resemble the young females. As the males become sexually mature the marsupial plates disappear and the second antennae reach about two-thirds the length of the first antennae. The second antennae in the young males may be very short or may extend beyond the short peduncle of the first antennae. The relative length of the joints of the gnathopods and peraeopods varies considerably with sex and size as I have shown in my figures. The males in this collection closely resemble the figure of *Sphaeromimonectes diomedae* given by Woltereck (1909,

pl. 3, fig. 8). He believed his specimen was a female, but the second antenna, which is only partially developed, and the slender second joints of the gnathopods and peraeopods clearly indicate that it was a male.

Mimonectes spandlii Stephensen and Pirlot.

Text-fig. 28.

Mimonectes steenstrupii Pirlot, 1929a (not Bovallius), p. 46, figs. 1-3.

Mimonectes spandlii Stephensen and Pirlot, 1931, p. 532, fig. 12.

Three specimens were taken at depths between 600 and 700 fathoms.

Distribution. — Stephensen and Pirlot give: temperate Atlantic, 38° 20' N., 9° 20' W.; 34° 41' N., 9° 30' W.

The type female described and figured by Pirlot (1929, p. 47, fig. 1), and Stephensen and Pirlot (1931, p. 533, fig. XII) was 7 mm. in length.

The present specimens are all females, one measuring 7 mm. and the others 15 mm. each. The larger specimens appear to have been quite globular in their natural condition, but are now deflated and much distorted. The first antennae are in general as figured by Pirlot (1929, p. 47, fig. 1a), but the first joint of the flagellum is thicker distally. The gland-cone of the second antenna and the joint upon which it is situated are very prominent, but the rest of the antenna is reduced to a minute knob and in one specimen is entirely lacking.

The gnathopods and peraeopods are short and rather stout and the dactyls are strong and curved. These Bermuda records extend the range of this species considerably westward in the Atlantic.

FAMILY MICROMIMONECTIDAE.

Mimonecteola beebei, new species.³

Text-figs. 29, 30

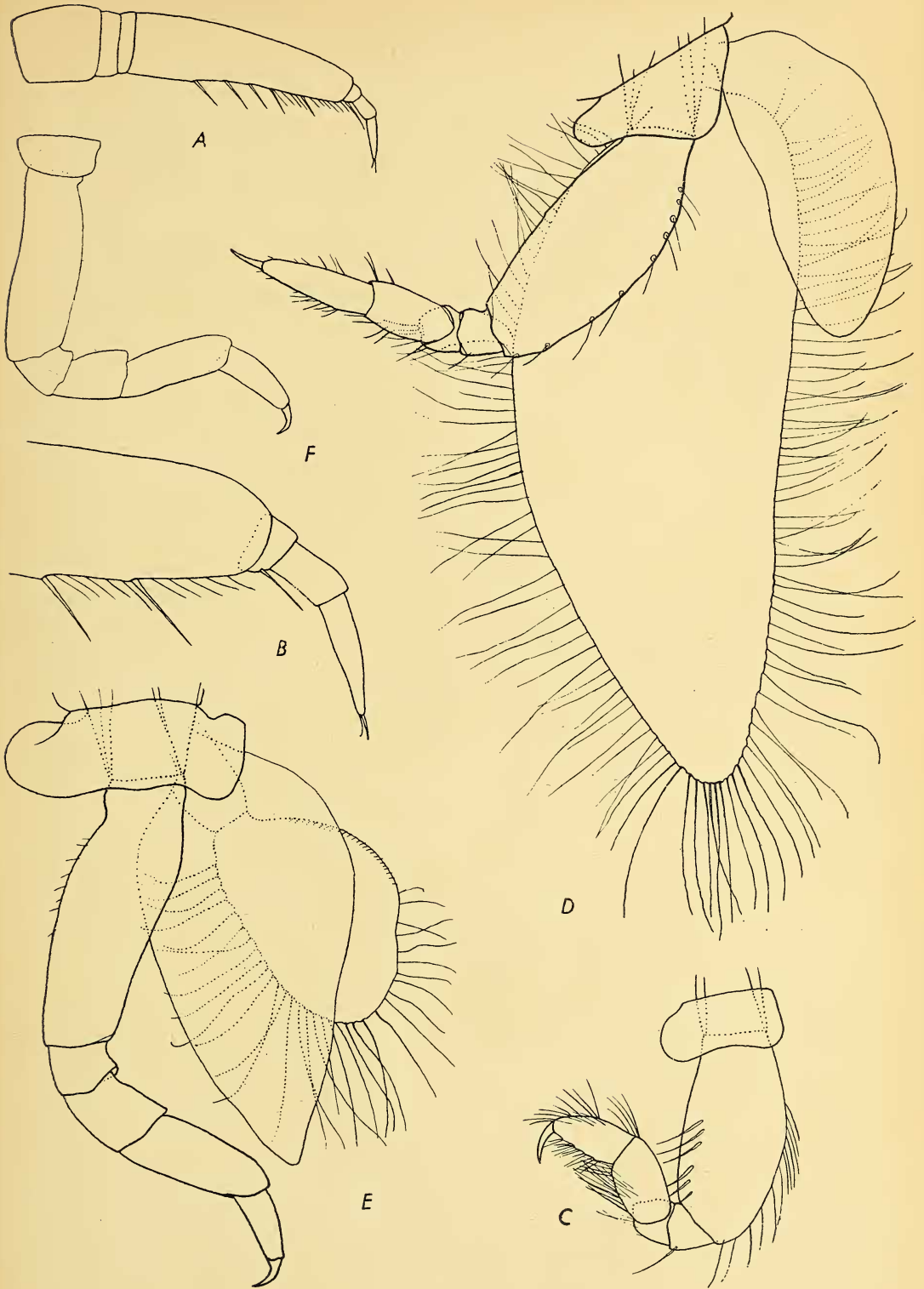
Two specimens, male and female, were taken at 1,000 fathoms.

Distribution of the genus.—*Mimonecteola* was founded by Woltereck in 1909 (p. 153) on the specimens taken by the steamer *Albatross* at Stations 4655 and 4717 off the coast of Peru in 1904 and 1905. In 1932 (p. 251) Barnard described *M. macronyx* from a specimen, questionably a female, taken by the R.S.S. *Discovery* in the east mid-Atlantic (2° 49' S., 9° 25' W.). The present record from Bermuda is the third of the occurrence of this deep sea genus.

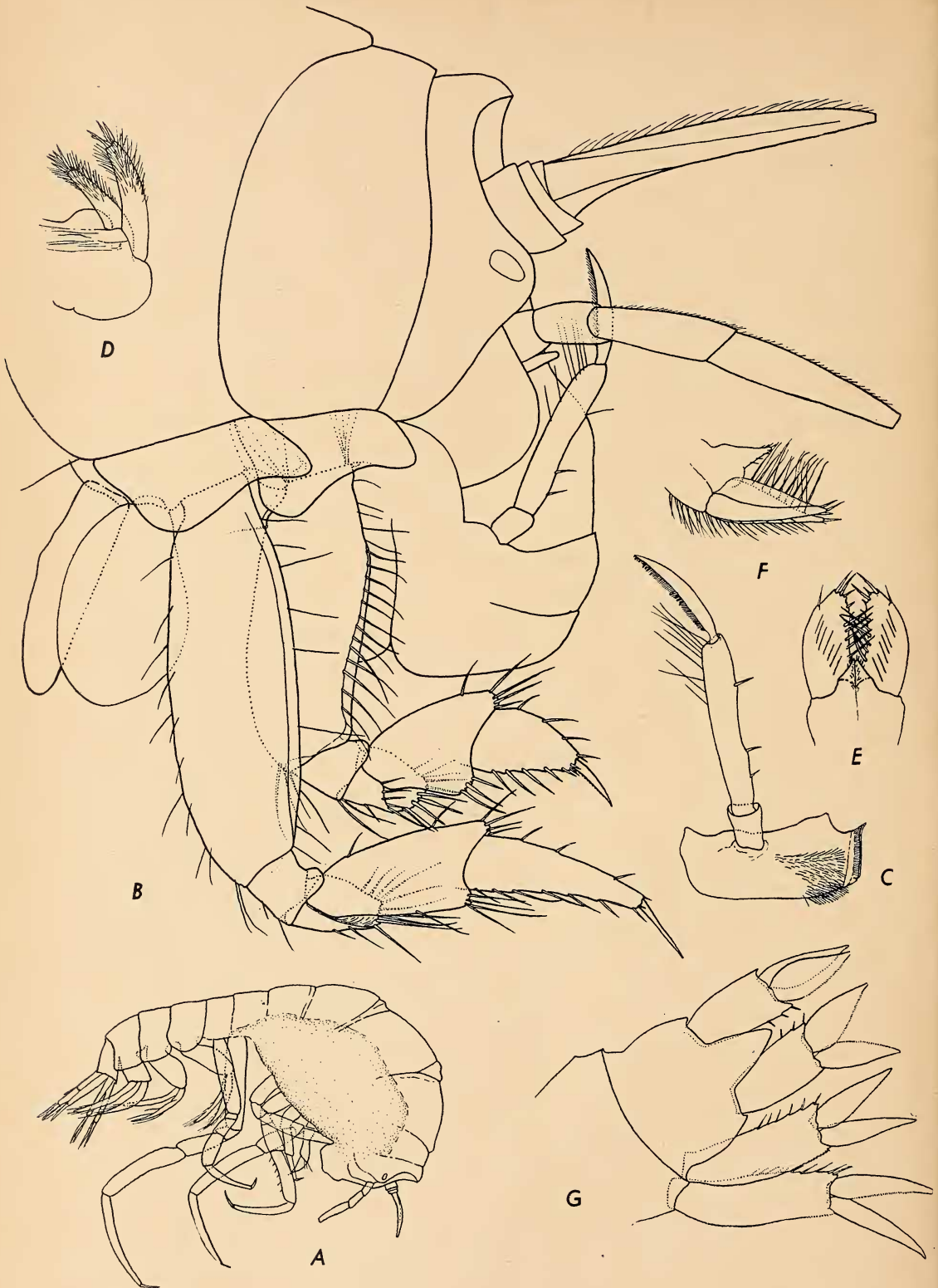
Mimonecteola diomedae Woltereck was dredged from 2,200 fathoms; *M. macronyx* Barnard from 800-1,000 (-0) m.; and the present species was taken at 1,000 fathoms.

Description of female. — Body much curved anteriorly. Head very short; ros-

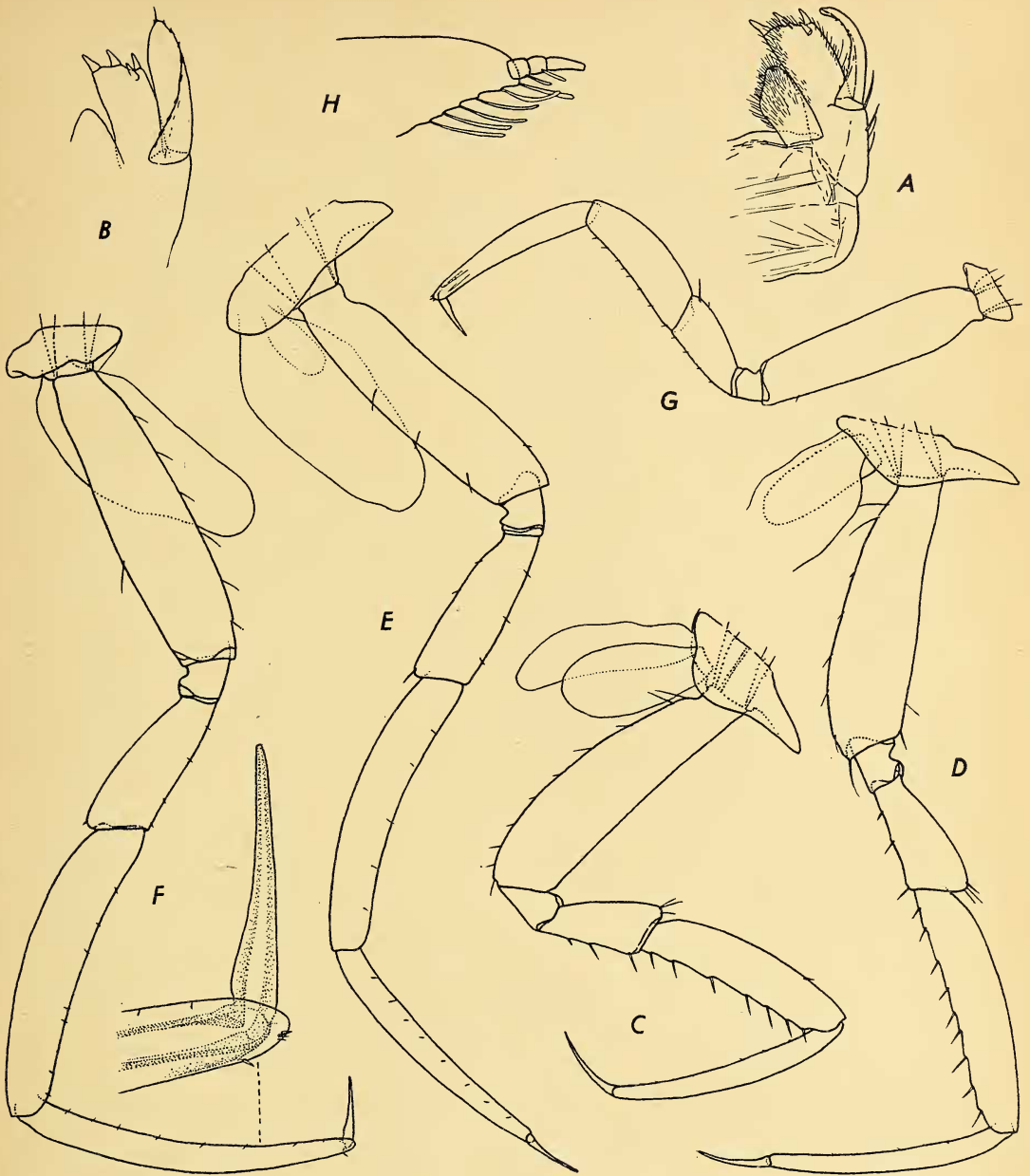
³ I take pleasure in naming this species in honor of Dr. William Beebe, the director of the Bermuda Oceanographic Expeditions.



TEXT-FIG. 28. *Mimonectes spandlii* Stephensen and Pirlot, female. **A**, antenna 1; **B**, end of antenna 1; **C**, gnathopod 1; **D**, gnathopod 2; **E**, pereopod 3; **F**, pereopod 5.



TEXT-FIG. 29. *Mimonecteola beebei*, new species, female. **A**, entire animal; **B**, anterior end of animal; **C**, mandible; **D**, maxilla 2; **E**, maxillipeds; **F**, maxillipeds, side view; **G**, uropods and telson.



TEXT-FIG. 30. *Mimonecteola beebei*, new species, female. A, B, maxilla 1; C, peraeopod 1; D, peraeopod 2; E, peraeopod 3; F, peraeopod 4; G, peraeopod 5. Male, H, end of antenna 1, top view.

trum very slightly produced and forming a very wide, obtuse angle viewed from above; side-lobes evenly rounding, rather prominent and bearing the small oval, indistinct, whitish eye. Antenna 1 strong, and rather broad viewed from above; peduncle short and composed of three joints; flagellum consisting of one very long, stout joint and probably several very short, slender joints,

which in this female specimen are missing, inside margin bearing a row of long setae. Antenna 2, first joint very large, second joint represented from the side only by the prominent gland-cone, third joint reaching to about the end of the gland-cone, fourth joint about half the length of the fifth; only the long first joint of the flagellum is present, the apex being transversely truncate

giving the impression that some terminal joints are missing; the upper margin of the fifth peduncular joint and the flagellum bear a row of very fine setae.

Mandible without molar, but in its place a mat of fine setae on inside surface, cutting-edge smooth except for a small sharp projection at the upper corner; palp very well developed, second joint one and one-half times the length of the third and bearing a few setae on the distal third of the inner margin and two or three spines on outer margin, third joint much slenderer than the second, tapering to a sharp apex and bearing a row of very fine, closely set spinules on inner margin. Maxilla 1, inner plate obliquely truncate and densely clothed in fine setae; outer plate rectangular and bearing four simple spine-teeth on the slightly oblique end; palp apparently consisting of one inwardly curving joint with rounding apex, and bearing on the apex and outer margin nine or ten very short spinules. Maxilla 2, inner plate narrower than outer, both densely setose and armed apically with a few spines. Maxillipeds of the *Lanceola* type, inner lobes conspicuous and conical.

Gnathopod 1, second joint moderately expanded with outer front margin bearing setae, fifth joint expanded distally, sixth joint a little shorter than fifth, converging distally and bearing spines on upper and lower margins, seventh joint very slightly curved. Gnathopod 2 longer than 1, second joint moderately expanded, fifth joint little expanded distally, sixth joint about equal in length to fifth but narrower, bearing spines on upper and lower margins and converging distally, seventh joint straight. Peraeopods 1 and 2 much alike, but 2 the longer, their coxal plates produced sharply forward, seventh joint long and slender and about one-third the length of the sixth joint. Peraeopods 3 to 5 much alike, the fourth being the longest, the fifth about three-fourths the length of the fourth, and all three bearing rather long, slightly curved seventh joints about one-fourth the length of the sixth joint.

Metasome segment 3 with lower lateral hind margin produced slightly backward. Uropod 3, peduncle equal in length to the rami, which are subequal. Telson over half the length of the peduncle of uropod 3, sides slightly convex and converging to the narrow, rounding apex. Length of female 11 mm.

Male.—The male specimen, the type, is 9 mm. in length and slenderer than the female. Antenna 1 bears three slender terminal joints, the two proximal of which are the shortest and bear a distal seta. The third or last of these joints ends abruptly, giving the impression that one or more terminal joints

are missing. Antenna 2 is like that of the female, and appears also to have lost the terminal joints of the flagellum. The type is in the American Museum of Natural History.

All the specimens of this genus so far taken have come from great depths, and all are of nearly the same size; *M. diomedae* about 9 mm., *M. macronyx* 9 mm., and the present species, *M. beebei*, 9 and 11 mm. All have been taken in tropical or subtropical waters; the first from just south of the equator in the Pacific, the second from the Atlantic just south of the equator, and the present species from the Bermuda waters.

FAMILY SCINIDAE.

Scina crassicornis (Fabricius).

Astacus crassicornis Fabricius, 1775, p. 415.

Tyro atlantica Bovallius, 1885a, p. 14.

Tyro sarsi Bovallius, 1887a, p. 9, pl. 1, figs. 1-17; pl. 2, figs. 1-10.

Tyro atlantica Bovallius, 1887a, p. 13, pl. 2, figs. 11-18.

Scina crassicornis Stebbing, 1904, p. 24 (literature & synonymy).

Scina crassicornis Wagler, 1926, p. 324, figs. 2, 3 (literature and synonymy).

Seventy-three specimens were taken at depths between 300 and 1,400 fathoms.

Distribution.—This species has been recorded from North, mid-, and South Atlantic; Mediterranean; South Pacific (New Zealand, Barnard, 1930); and Indian Ocean. Davis Strait (64° N., 55° W., Stephensen, 1923) appears to be the most northern record and 65° 57' S., 88° 58' E. (Wagler, 1927) the most southern. It has been recorded from the Gulf of Maine (Bigelow), but not heretofore from the Bermuda region.

Barnard (1932, p. 258) records females 21 mm. in length from the east mid-Atlantic, but the largest specimens (females) in the present collection measure 15 mm.

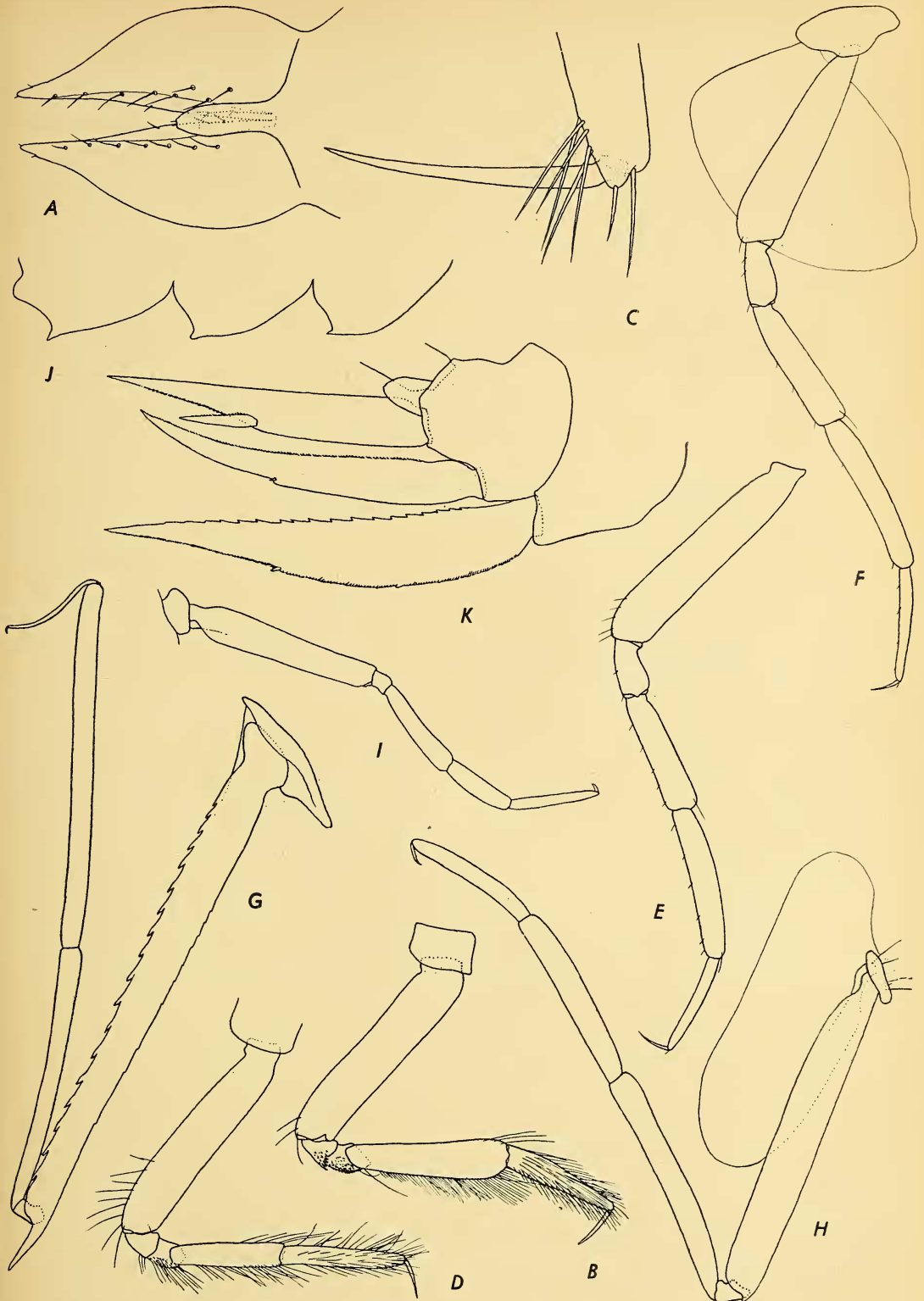
In many of the Bermuda specimens the relative proportions of the joints of the third peraeopod are more like those given by Bovallius for *Tyro sarsi* (= *S. crassicornis* Fabr.) (1887, p. 1; pl. 2, figs. 1-10) than those given by Wagler (1926, p. 326, fig. 2a). Barnard (1932, p. 258) has noted discrepancies in the proportions of the joints of the fourth peraeopod in some of the females which he examined.

Scina crassicornis var. *bermudensis*, new variety.

Text-fig. 31.

Fifty specimens were taken at depths between 300 and 1,000 fathoms.

These specimens appear to me to be a variety of *Scina crassicornis*. In peraeopod 3 the fourth joint is a little more than two-



TEXT-FIG. 31. *Scina crassicornis* var. *bermudensis* new var., male. A, maxillipeds; B, gnathopod 1; C, end of gnathopod 1; D, gnathopod 2; E, peraeopod 1; F, peraeopod 2; G, peraeopod 3; H, peraeopod 4; I, peraeopod 5; J, metasome segments; K, uropods and telson.

thirds as long as the fifth, and in peraeopod 4 the fourth, fifth and sixth joints are consecutively shorter. The seventh joint of peraeopod 4 is short and curved, as figured by Bovallius (1887, pl. 1, figs. 1, 2) and not long and straight, as figured by Wagler (1926, p. 326, fig. 2a). The relative proportions of the joints of the last three peraeopods in *S. crassicornis* appear to be quite variable, so it is possible that the two forms may grade into each other. The largest specimen, a female, measures 23 mm. from front to head to the end of uropod 3.

***Scina curvidactyla* Chevreux.**

Scina curvidactyla Chevreux, 1914, p. 3, fig. 2.

Scina curvidactyla Wagler, 1926, p. 328, fig. 4.

Fifty-one specimens were taken at depths between 300 and 1,000 fathoms.

Distribution.—This species has been recorded from the North, tropical, and South Atlantic; Mediterranean; South Pacific (New Zealand, Barnard, 1930, p. 401); and Indian Ocean. It has been taken in the eastern part of the North Atlantic, but has not heretofore been recorded from the western part.

Barnard (1932, p. 259), recorded a female from the Southeast Atlantic measuring 20 mm. which he said was the largest specimen recorded up to that time. Among the Bermuda material is a female, with fully developed marsupial plates, measuring 23 mm. from front to head to end of the third uropods. In the Bermuda specimens the dactyl of the fourth peraeopods is not as stout as figured by Wagler (1926, p. 329, fig. 4a), but is very short, slender, and much curved, agreeing with the observations made by Barnard (1932, p. 259).

***Scina borealis* (Sars).**

Clydonia borealis Sars, 1882, p. 77, pl. 3, figs. 1, 1a, b.

Tyro clausii Bovallius, 1885a, p. 14.

Tyro borealis Bovallius, 1887a, p. 16.

Tyro clausi Bovallius, 1887a, p. 18, pl. 2, figs. 19-28.

Tyro clausi Bovallius, 1887b, p. 552, pl. 40, figs. 1-3.

Scina borealis Sars, 1890, p. 20, pl. 8.

Scina borealis Wagler, 1926, p. 337, figs. 9-11.

One specimen was taken at a depth of 800 fathoms.

Distribution.—This widely distributed species has been recorded from the North Atlantic (63° N., 26° W. and the Lofoten Islands); eastern North Atlantic; South Atlantic down to the Agulhas Current; North Pacific (Okhotsk Sea, Bering Sea, Behning),

Strait of Georgia and Gulf of Alaska (Thorsteinson); South Pacific (New Zealand, Barnard); East Indies (Pilot); Indian Ocean (Walker and Wagler); and the Mediterranean. It was taken in the Arctic Ocean by the Norwegian North Polar Expedition (80° N., 134° E., Sars), and in the Antarctic by the British Antarctic Expedition (71° 49' S., 167° 32' W., Barnard). The present record is the first for the western North Atlantic.

***Scina incerta* Chevreux.**

Scina incerta Chevreux, 1900, p. 123, pl. 14, figs. 9 and 12.

Scina incerta Wagler, 1926, p. 331, figs. 5-7.

Twenty-eight specimens were taken at depths between 700 and 1,000 fathoms.

Distribution.—North Atlantic (47° N., 22° W., Chevreux); tropical and South Atlantic (down to 35° S., Wagler and Barnard); tropical waters of the Indian Ocean (Wagler). It has not heretofore been recorded from the western part of the North Atlantic.

Chevreux gives for the length of the type 8.5 mm., but Wagler gives 21-22 mm. as the length of his largest specimens. The largest specimens in Bermuda are 13 and 14 mm. in length. It would seem, therefore, that the species was described from a rather small, immature specimen.

***Scina excisa* Wagler.**

Scina excisa Wagler, 1926, p. 398, fig. 39.

Scina excisa Wagler, 1927, p. 103, fig. 9.

One male specimen was taken at a depth of 200 fathoms.

Distribution.—Wagler in 1926, recorded this species from the Gulf of Guinea and the Agulhas Bank in the South Atlantic, and from the Indian Ocean. In 1927 he recorded it from 21° N., 32° W. in the Atlantic, and from 64° S. in the Antarctic. The present record extends the range somewhat northward, and considerably westward.

***Scina spinosa* Vosseler.**

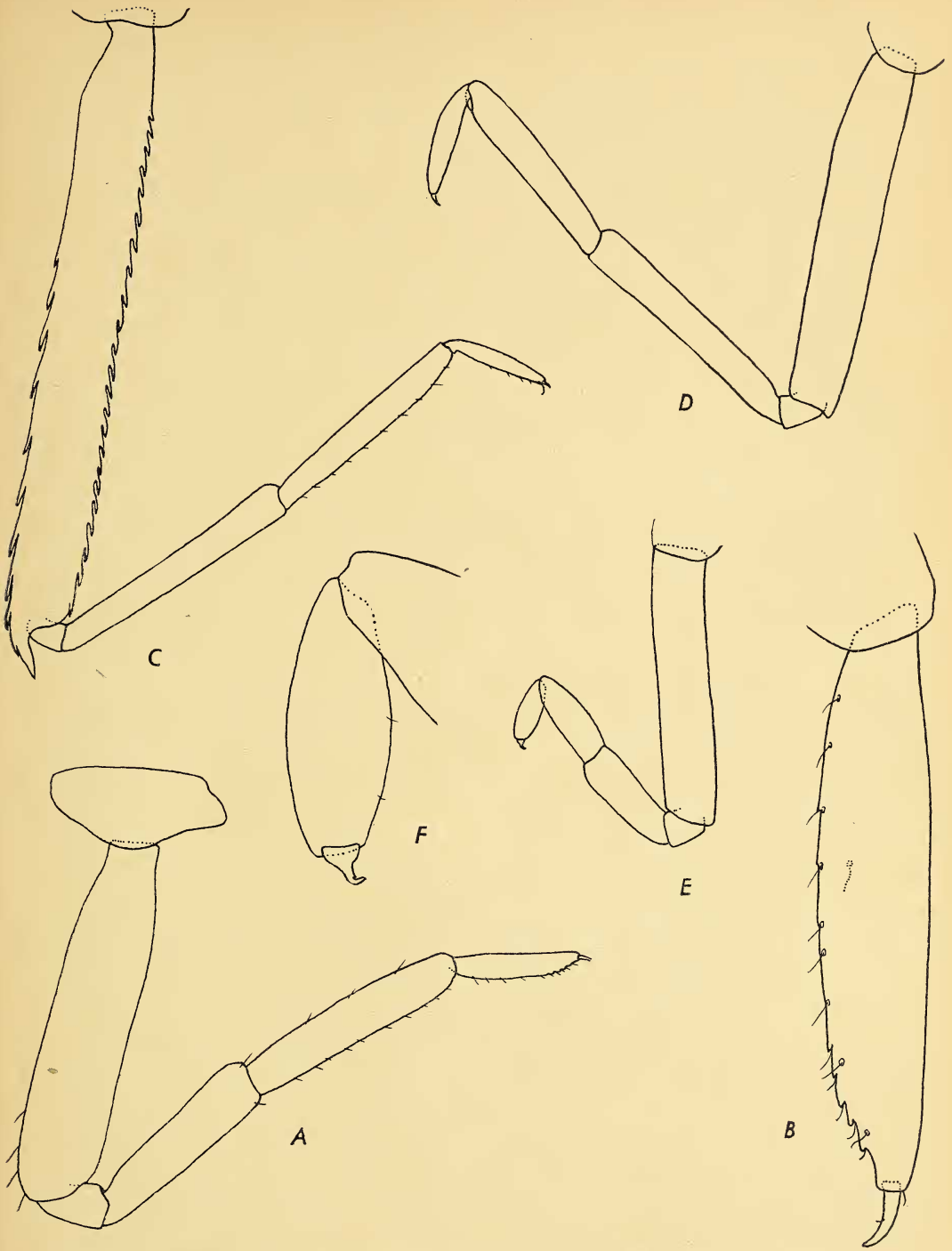
Text-fig. 32.

Scina spinosa Vosseler, 1901, p. 108, pl. 10, figs. 11-15.

Scina spinosa spinosa Wagler, 1926, p. 350, figs. 13c, 15a-e.

Seven female specimens were taken at depths between 800 and 1,000 fathoms.

Distribution.—This species was described by Vosseler from the Atlantic from the South Equatorial Current, and in 1926 it was recorded by Wagler from the Benguela Current (about 31° S.); from south of Bouvet Island (about 55° S.); and from the South Equatorial Current in the Indian Ocean. The present Bermuda records are the first for the North Atlantic.



TEXT-FIG. 32. *Scina spinosa* Vosseler. **A**, peraeopod 1, right; **B**, sixth and seventh joints of peraeopod 1; **C**, peraeopod 3, left; **D**, peraeopod 4, right; **E**, peraeopod 5, right; **F**, sixth and seventh joints of peraeopod 5.

Wagler records two varieties of *spinosa*, the typical form *spinosa spinosa* and a new variety *spinosa affinis*. The specimen from

which my figures were made is a 12 mm. female, with fully developed marsupial plates. The relative proportions of the joints

of the peraeopods do not agree with those of either Vosseler's or Wagler's figures. The third, fourth and fifth joints of peraeopod 3 combined are noticeably shorter than the second joint, whereas in the figures of Vosseler and Wagler they are longer than the second joint. The sixth joint is less than half the length of the fifth, but in Vosseler's and Wagler's figures it is over half the length of the fifth. In the smaller, immature females the proportions of the third peraeopod are closer to those given by Vosseler and Wagler. The serrations on the second joint of peraeopod 3 are more like those figured by Wagler (fig. 15a) than those of Vosseler (pl. 10, fig. 12). The sixth joint of peraeopod 1 is more like Wagler's figure (fig. 13d) of *S. s. affinis* than that of *S. s. spinosa* (fig. 13c).

The proportions and characters of the peraeopods appear to vary considerably in this species, so that it is not possible to assign the present specimens to either of the varieties given by Wagler as they partake of the characters of each.

***Scina vosseleri* Tattersall.**

Scina vosseleri Tattersall, 1906, p. 7, pl. 1, figs. 1-8.

Scina vosseleri Wagler, 1926, p. 416, figs. 48, 49.

Four specimens, male and female, were taken at depths between 500 and 1,000 fathoms.

Distribution.—This species was described from the North Atlantic (53° N., 15° W.). It has since been recorded as far south as 31° S., 9° E., and in the Indian Ocean, 29° S., 89° E. and 26° S., 93° E. The present records are the first for the Bermuda area.

Wagler records a female measuring 15 mm. from front of head to end of third uropods. The usual length appears to be from 6 to 10 mm. The largest specimen from Bermuda, a female, measures about 12 mm.

***Scina marginata* (Bovallius).**

Tyro marginata Bovallius, 1885a, p. 15.

Tyro marginata Bovallius, 1887a, p. 21, pl. 3, figs. 18-33.

Scina marginata Stebbing, 1888, p. 1272.

Scina marginata Chevreux, 1900, p. 122, pl. 14, fig. 8, pl. 15, fig. 1.

Scina marginata Wagler 1926, p. 361, figs. 19-21.

One female specimen taken at a depth of 300 fathoms.

Distribution.—This species was described from the Mediterranean by Bovallius. It has been recorded by Walker (1903, p. 231) from 52° N., 15° W., and by Wagler from 19° 1' S., 20° W. Stephensen recorded it from the Mediterranean (1918, p. 27), and Barnard has recorded it from the northern

Arabian Sea (1937, p. 181). The present record is the first for Bermuda.

Bovallius gives 6 mm. as the length of his specimen, but Wagler has recorded a specimen measuring 9 mm. in length. The Bermuda specimen, a female, is about 8 mm. in length.

***Scina submarginata* Tattersall.**

Scina submarginata Tattersall, 1906, p. 12.

Scina latipes Stephensen, 1918, p. 32, fig. 7.

Scina submarginata Wagler, 1926, p. 367, figs. 22-24 (literature and synonymy).

One female specimen was taken at a depth of 800 fathoms.

Distribution.—Tattersall described this species from the North Atlantic (53° N., 15° W.). Stephensen has recorded it (*Scina latipes*) from 36° 53' N., 7° 26' W. Wagler records it from the vicinity of the Cape Verde Islands; off the mouth of the Kongo; and from 55° 57' S. In the Indian Ocean he records it from the warm and temperate waters. Barnard has recorded it from the South Atlantic (32° 45' S., 8° 47' W.). It has not heretofore been recorded from the Bermuda area.

Tattersall's specimen measured 4.5 mm. Stephensen gives 7 mm. as the length of *S. latipes*. Wagler's largest specimen measured 8.5 mm. The specimen from Bermuda, a female, is about 6 mm. in length.

Chevreux (1919, p. 13) has made *submarginata* a synonym of *marginata*, but I am following Wagler and giving them both specific rank for the present.

***Scina tullbergi* (Bovallius).**

Tyro tullbergi Bovallius, 1885a, p. 15.

Tyro tullbergi Bovallius, 1887a, p. 23, pl. 3, figs. 1-9.

Tyro tullbergi Bovallius, 1887b, p. 552, pl. 40, figs. 4-10.

Tyro pacifica Bovallius, 1887a, p. 25, pl. 3, figs. 10-17.

Scina concors Stebbing, 1895, p. 360, pl. 53B.

Scina tullbergi Wagler, 1926, p. 384, figs. 34, 35.

One male specimen was taken at a depth of 200 fathoms.

Distribution.—North, tropical and South Atlantic; Pacific (Coral Sea, Barnard, 1931) (Nicaragua, Bovallius, 1887); Indian Ocean (Wagler, 1926); and Mediterranean. It is new to the Bermuda area.

Bovallius gives 4 mm. as the length of the species. Wagler gives 6 mm., including the antennae. Barnard gives 3 mm. as the length of the male which he examined. Stebbing gives 5 mm. (*S. concors*). The Bermuda specimen, a male, measures about 3.5 mm. exclusive of the antennae.

***Scina stenops* Stebbing.**

Scina stenops Stebbing, 1895, p. 354, pl. 52a.

Scina chuni Garbowski, 1896, p. 71, pl. 1, fig. 1; pl. 8, figs. 110-114; pl. 9, figs. 115-124.

Scina stenops Wagler, 1926, p. 419, fig. 50.

One male specimen was taken at a depth of 400 fathoms.

Distribution.—North Atlantic to 46° N. (Chevreux, 1935, p. 158, Station 1639); tropical Atlantic; South Atlantic down to Agulhas Bank (Wagler, 1926, p. 422); Indian Ocean (Wagler, 1926, p. 422), and Mediterranean (Garbowski, 1896). The present record is the first for Bermuda.

The female which Stebbing figured measured about 7 mm., and the present specimen, which is a male, measures about 5 mm. These measurements are from the front of the head to the end of the third uropods. Stebbing gives half an inch as the length, which is about 13 mm., but his measurement includes the antennae. Wagler gives 15.5 mm. as the length of the largest males taken by the Deepsea Expedition and his measurement also includes the antennae.

***Acanthoscina acanthodes* (Stebbing).**

Scina acanthodes Stebbing, 1895, p. 352, pl. 51.

Acanthoscina serrata Vosseler, 1900, p. 675, figs. 1-4.

Acanthoscina acanthodes Chevreux, 1905e, p. 1.

Acanthoscina acanthodes Wagler, 1926, p. 426, figs. 51, 52.

One male specimen was taken at a depth of 100 fathoms.

Distribution.—In the Atlantic it has been recorded from 61° N. (Stephensen) to 28° S. (Wagler). In the Indian Ocean it has been recorded from the tropical waters. The present record is the first for the Bermuda area.

Wagler gives 6.3 mm. for the length of his largest specimen, a female.

FAMILY CYSTISOMATIDAE.***Cystisoma magna* (Woltereck).**

Thaumtops magna Woltereck, 1903, p. 455, fig. 2.

Thaumtops magna Spandl, 1927, p. 171, figs. 8, 9a-d.

Fifteen specimens, male and female, were taken at depths between 200 and 1,000 fathoms.

Distribution.—This species of *Cystisoma* has been recorded from the Indian Ocean and the South Atlantic. The present records are the first for the North Atlantic.

Carcinologists have found it difficult to discover reliable characters for determining the species of the genus *Cystisoma*. All characters apparently vary considerably

with sex and age. Stebbing, for instance, says on page 1334 of his *Challenger* report, "It is conceivable that by a diligent counting and comparing of the teeth on various parts of the animal (*Cystisoma spinosum*) and comparative measurements of the limbs, one might make a species of every specimen; on the other hand, among specimens from so many parts of the world some specific variation might be expected, difficult as it is to seize any character which can be regarded as at once so salient and so constant as certainly to warrant the establishment of any new species." Stephensen in his report on the hyperiids of the Danish Oceanographic Expeditions, 1908-1910 (1918, pp. 56-59) has discussed the problem of characterizing the species of this genus and has given a key based on the fusion of the mesosome segments, the length of the antenna, the number of ventral spines and the breadth of the first free joint of the last peraeopod.

Barnard in his *Discovery* report (1932, p. 268) says, "Of this genus it may well be said that we describe specimens, not species. There are some ten or eleven nominal species, but the latest writers agree on the difficulty of finding suitable diagnostic characters to define the species." He has given a list of the species arranged according to the ascending number of mandibular and ventral spines, and has also given a list of nine species which he believes may perhaps be defined, and three species which he believes insufficiently described.

I have identified five large females and three smaller males as *C. magna* because their diagnostic characters proclaim them to be that species according to the schemes of Stephensen and Barnard mentioned above. Three of these females are about 90 mm. in length and the other two smaller. In these specimens the usual number of mandibular spines is two. Occasionally there are two on one side and three on the other. In two of the large females there are two large spines and one small proximal spine on each side. Of the five large females two have five ventral spines on each side, two have five on one side and four on the other, and one has five on one side and six on the other. In the three males the number of spines is constant, there being two mandibular spines on each side and five ventral spines on each side. The females all have the expanded chelate sixth joint in the last pair of peraeopods, and the antennae are short. The uropods are as figured by Spandl (1927, p. 172, fig. 9d). The first two mesosome segments are fused.

There are six specimens, the largest 80 mm., of which I am not sure of the sex.

Beside the specimens which I have identified as *C. magna*, there are four which are too small and immature for identification specifically.

I should mention, perhaps, that in the Bermuda specimens of *C. magna* the number of marginal spines is greater than is shown in Woltereck's fine photograph (1903, pl. 2, fig. 2). In the photograph there are ten spines, but in the Bermuda specimens the number varies between fifteen and eighteen, the number rarely being the same on both sides. How important this character is for diagnosis I do not know.

Woltereck's figure of *C. magna* referred to above is from a retouched photograph which is stated to be natural size, and if this be correct the specimen would measure about 120 mm.

FAMILY VIBILIIDAE.

Vibilia cultripes Vosseler.

Text-fig. 33.

Vibilia cultripes Vosseler, 1901, p. 121, pl. 11, figs. 6-18.

Vibilia cultripes Chevreux and Fage, 1925, p. 388, fig. 392.

Six specimens, male and female, were taken at depths between 300 and 900 fathoms.

Distribution.—This species was described from the South Equatorial Current in the Atlantic from a single specimen. It has since been recorded from the North Atlantic; Mediterranean; Southwest Atlantic; Indian Ocean; and Pacific. In the North Atlantic, it has not, heretofore, been recorded as far west as Bermuda. Vosseler's specimen, which was a female, measured 12 mm. The female which I have figured measures about 13.5 mm. from front of head to end of uropods.

Vibilia viatrix Bovallius.

Text-fig. 34.

Vibilia viatrix Bovallius, 1887a, p. 63, pl. 9, figs. 1-13.

Vibilia californica Holmes, 1908, p. 490, figs. 1, 2.

Vibilia viatrix Chevreux and Fage, 1925, p. 385, fig. 390.

Eighty-six specimens were taken between the surface and 1,000 fathoms.

Distribution.—Bovallius gives for the distribution of this species North and South Atlantic, the Pacific and Indian Oceans. It was recorded from the Mediterranean by Stephensen. Holmes recorded it from the coast of southern California under the name *Vibilia californica*. The present records are the first for the Bermuda region.

FAMILY PARAPHRONIMIDAE.

Paraphronima crassipes Claus.

Paraphronima crassipes Claus, 1879b, pp. 65, 66, pl. 1, figs. 6-9, pl. 2, fig. 10.

Paraphronima clypeata Bovallius, 1885a, p. 11, fig. 2.

Paraphronima pectinata Bovallius, 1887c, p. 13.

Paraphronima crassipes Bovallius, 1889, p. 30, pl. 2, figs. 11-15.

Paraphronima clypeata Bovallius, 1889, p. 33, pl. 2, fig. 16-40.

Paraphronima crassipes Chevreux and Fage, 1925, p. 390, figs. 393, 394.

Four specimens, male and female, were taken at depths between 200 and 800 fathoms.

Distribution.—North and South Atlantic; South Pacific (Australia); Indian Ocean (Barnard, 1937); Mediterranean (Stephensen, 1924). The present records are the first for the Bermuda region.

Bovallius gives as the length of this species 5-8 mm. for the male and 6-9 for the female, but for *P. clypeata*, which is now considered a synonym of *P. crassipes*, he gives a maximum of 16 mm. for the female. Barnard, however, records a female from the South Atlantic (39° S., 17° E.) which measures 17 mm. in length. The largest specimen from Bermuda measures only about 7 mm.

FAMILY ANCHYLOMERIDAE.

Anchylomera blossevillii M. Edw.

Anchylomera blossevillii Milne Edwards, 1830, p. 394.

Anchylomera blossevillii Stebbing, 1888, p. 1433, pl. 177 (literature).

Anchylomera blossevillii Chevreux and Fage, 1925, p. 414, fig. 410.

Five specimens were taken at depths between 25 and 800 fathoms.

Distribution.—A widely distributed species, having been recorded from the North and South Atlantic; North and South Pacific; Indian Ocean; and the Mediterranean. It has been recorded as occurring off the coast of Newfoundland, and it has been reported a few degrees northeast of Bermuda, but not heretofore immediately south of the Islands.

Primno macropa Guérin.

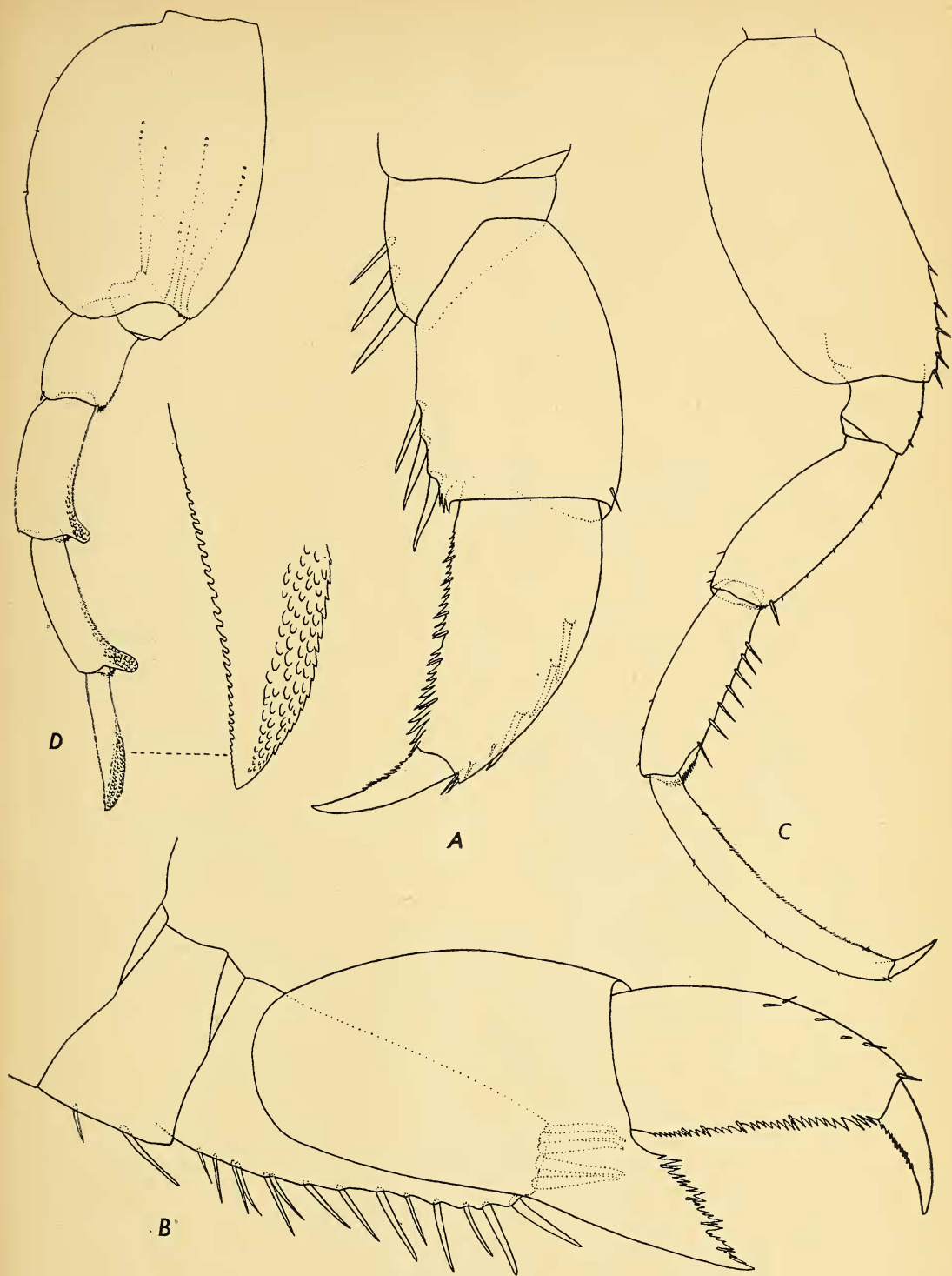
Primno macropa Guérin, 1836, p. 4, pl. 17, figs. 1a-f.

Euprimno macropa Bovallius, 1889, p. 400, pl. 27, figs. 23-40, pl. 28, figs. 1-2.

Euprimno macropa Chevreux and Fage, 1925, p. 416, fig. 411.

Three hundred and sixty specimens were taken at depths between the surface and 1,000 fathoms.

Distribution.—North and South Atlantic; North and South Pacific; Indian Ocean; Antarctic (66° S., 89° E., Spandl); and Mediterranean. This is a very common and widely distributed hyperiid, but it has not



TEXT-FIG. 33. *Vibilia cultripipes* Vosseler, female. **A**, gnathopod 1; **B**, gnathopod 2; **C**, peraeopod 4; **D** peraeopod 5.

heretofore been recorded from Bermuda. It is of medium size, measuring between 5 and 12 mm.

***Phrosina semilunata* Risso.**

Phrosina semilunata Risso, 1822, p. 245.

Phrosina semilunata Stebbing, 1888, p. 1425, pl. 176.

Phrosina pacifica Stebbing, 1888, p. 1430.

Phrosina australis Stebbing, 1888, p. 1431.

Phrosina semilunata Chevreux and Fage, 1925, p. 413, fig. 409.

Nine specimens were taken at depths between 50 and 1,000 fathoms.

Distribution.—A cosmopolitan species which has been recorded from the North and South Atlantic; North and South Pacific; Indian Ocean; Mediterranean; and the Antarctic (Spandl, 1927, p. 168, 65°16' S., 80°28' E.).

The present records are the first for the Bermuda Islands, but the species was taken by the *Challenger* (35°18' N., 51°42' W.) about 700 miles northeast of the islands. The length of the animal ranges between 8-30 mm. The largest specimens in the present collection are about 17 mm. in length.

FAMILY PHRONIMIDAE.

***Phronima sedentaria* (Forskål).**

Cancer sedentaria Forskål, 1775, p. XXI and 95.

Phronima sedentaria Latreille, 1803, p. 291.

Phronima sedentaria Stebbing, 1888, p. 1357, pl. 162B.

Phronima sedentaria Bovallius, 1889, p. 354, pl. 16, figs. 1-3 (literature).

Sixty-three specimens were taken at depths between 100 and 1,000 fathoms.

Distribution.—North and South Atlantic; North and South Pacific; Indian Ocean; Mediterranean.

This species has been recorded from both the east and west coasts of the United States, but the present records are the first for Bermuda.

Bovallius gives as the length of this species 10-36 mm. In regard to the house in which the species of *Phronima* live, he says (1889, p. 365), "It seems beyond doubt that it in most cases consists of the tests of *Tunicata* and *Siphonophora*, which have been attacked, and adapted for its purpose, by the *Phronima* itself."

***Phronima atlantica* Guérin.**

Phronima atlantica Guérin, 1836, p. 7, pl. 18, fig. 1.

Phronima atlantica Vosseler, 1901, p. 21, pl. 2, figs. 1-10 (literature).

Twelve specimens were taken at depths between 25 and 1,400 fathoms.

Distribution.—North and South Atlantic;

North and South Pacific; Indian Ocean; Mediterranean; Antarctic (65° S., 88° E., Mogk). It has not heretofore been recorded from Bermuda.

***Phronima atlantica*, var. *solitaria* Guérin.**

Phronima solitaria Guérin, 1836, p. 21.

Phronima solitaria Bovallius, 1889, p. 372, pl. 16, figs. 4-7.

Phronima atlantica var. *solitaria* Vosseler, 1901, p. 23, pl. 2, fig. 5.

Four specimens were taken at depths between 25 and 900 fathoms.

Distribution.—North and South Atlantic; North Pacific; Indian Ocean; Mediterranean. The present records are the first for Bermuda.

***Phronima colletti* Bovallius.**

Phronima colletti Bovallius, 1887c, p. 25.

Phronima colletti Bovallius, 1889, p. 378, pl. 16, figs. 27-47.

Phronima colletti Vosseler, 1901, p. 32, pl. 3, figs. 8-10, pl. 4, figs. 1-3.

Twelve specimens were taken at depths between 50 and 1,000 fathoms.

Distribution.—North and South Atlantic; Indian Ocean; and Mediterranean. The present records are the first for Bermuda.

***Phronima pacifica* Streets.**

Phronima pacifica Streets, 1877, p. 128.

Phronima pacifica Bovallius, 1889, p. 382, pl. 15, figs. 48-50.

Phronima pacifica Vosseler, 1901, p. 29, pl. 3, figs. 4-7.

Eight specimens were taken at depths between 50 and 1,000 fathoms.

Distribution.—North and South Atlantic; North and South Pacific; Indian Ocean; Mediterranean. It has not heretofore been recorded from Bermuda.

***Phronima stebbingii* Vosseler.**

Phronima stebbingii Vosseler, 1900, p. 402.

Phronima stebbingii Vosseler, 1901, p. 36, pl. 4, figs. 4-10.

Six specimens were taken at depths between 300 and 1,000 fathoms.

Distribution.—Tropical and subtropical Atlantic and Pacific (Bovallius); vicinity of Sierra Leone (Stebbing); equatorial Atlantic (Vosseler); South Atlantic (Stewart); Mediterranean (Chevreux). The present records are the first for Bermuda.

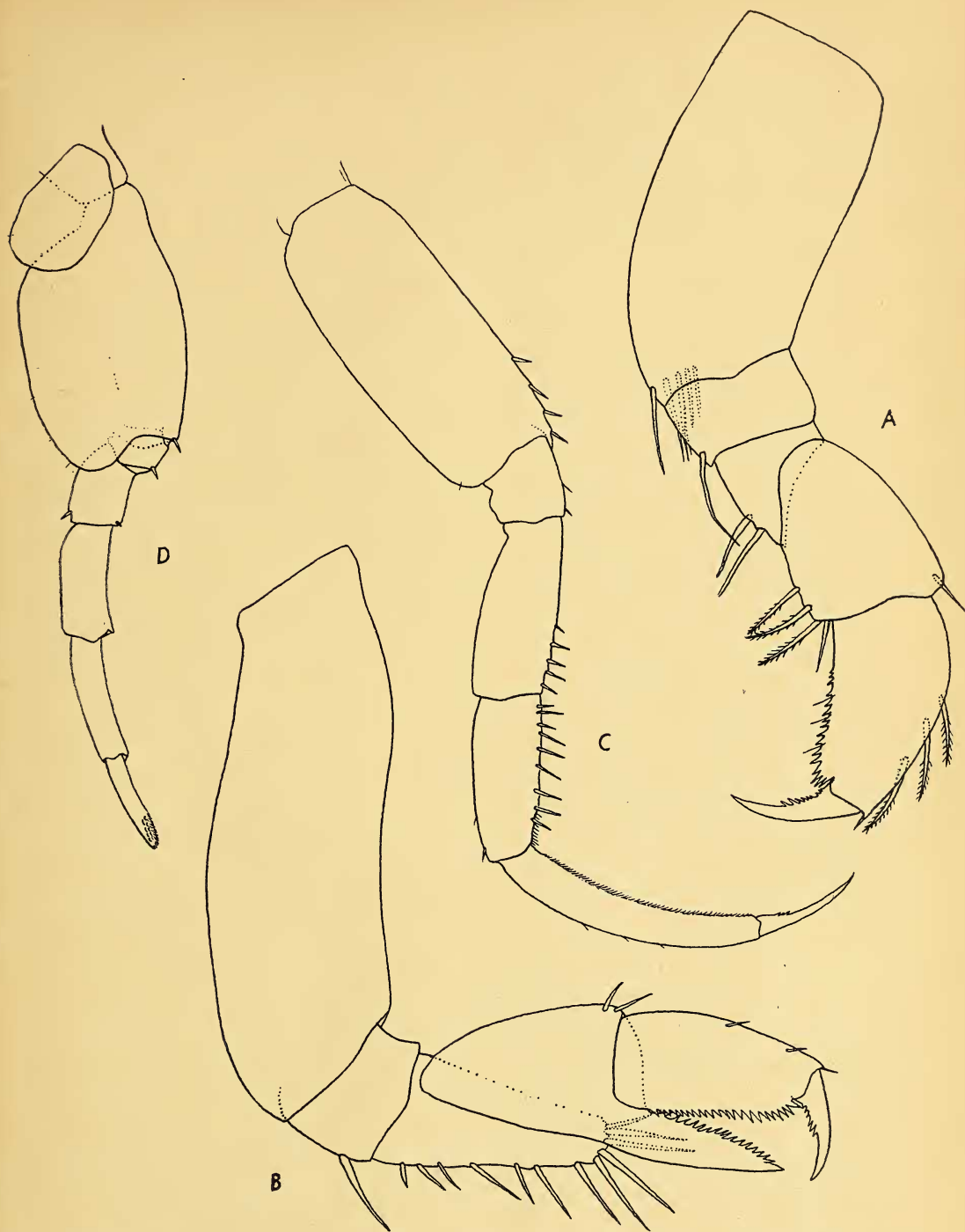
***Phronimella elongata* (Claus).**

Phronimella elongata Claus, 1862a, p. 193, pl. 19, figs. 2, 3, & 7.

Phronimella elongata Claus, 1871, p. 149.

Anchylonyx hamatus Streets, 1877, p. 131.

Phronimella elongata Claus, 1879b, p. 63, pl. 2, fig. 15, pl. 4, fig. 26.



TEXT-FIG. 34. *Vibilia viatrix* Bovallius, male. **A**, gnathopod 1; **B**, gnathopod 2; **C**, peraeopod 4; **D**, peraeopod 5.

Phronimella elongata and *filiformis* Bovalius 1887c, p. 26.

Phronimella hippocephala Giles, 1887, p. 217, pl. 3, fig. 3.

Five specimens were taken at depths between 500 and 1,000 fathoms.

Distribution.—North, mid- and South Atlantic; Mediterranean; North Pacific

(Streets, 34° N.); South Pacific (Streets, 30° S.); New Zealand (Barnard, 1932); Indian Ocean; East Indies (Stebbing, 1888); Antarctic (Mogk, 63° S., 82° E.). The present records are the first for the Bermuda area.

Dr. Stephensen says that the size of adult males is as a rule from 8 to 10 mm., very rarely 11 or 12 mm., and that the adult female is as a rule 16 mm. or very rarely 17 to 19 mm. The largest specimens in the Bermuda collection are about 11 mm.

FAMILY HYPERIIDAE.

Hyperia bengalensis (Giles).

Lestrigonus bengalensis Giles, 1887, p. 224, pl. 6, figs. 1-10; pl. 7, figs. 1-9.

Hyperia promontorii Stebbing, 1888, p. 1385, pl. 166B.

Hyperia disschystus Stebbing, 1888, p. 1388, pl. 167.

Hyperia schizogeneios Stebbing, 1888, p. 1391, pl. 168.

Hyperia zebui Stebbing, 1888, p. 1394.

Hyperia latissima Bovallius, 1889, p. 229, pl. 11, figs. 26-36.

Hyperia thoracica Bovallius, 1889, p. 233, pl. 11, figs. 37-41.

Hyperia gilesi Bovallius, 1889, p. 236.

Themistella steenstrupi Bovallius, 1889, p. 313, pl. 13, figs. 47-60.

Hyperia macrophthalma Vosseler, 1901, p. 70, pl. 6, figs. 16-25.

Hyperia hydrocephala Vosseler, 1901, p. 74, pl. 6, figs. 26-28; pl. 7, figs. 1-5.

Hyperia bengalensis Pirlot, 1939b, p. 35 (literature).

Two specimens, male and female, were taken at depths of 50 and 800 fathoms.

Hyperia bengalensis was described from the Bay of Bengal. It has since been recorded under different names from the North and South Atlantic; Mediterranean; Arabian Sea; and South Pacific (off Cape Howe, Australia).

The specimen from Net 1340 is a fully developed male measuring 4 mm. in length, and the specimen from 1331 is a female about half the size of the male. Pirlot (1939, p. 35) has given the complete synonymy for this species. The present records are the first for the Bermuda region.

Hyperia spinigera Bovallius.

Text-fig. 35.

Hyperia spinigera Bovallius, 1889, p. 191, pl. X, figs. 33-39.

Eleven specimens, male and female, were taken at depths between 500 and 900 fathoms.

Distribution.—This species has been recorded from Spitzbergen; off the northern

coast of Norway; the Labrador Current; west coast of Ireland; south coast of England; East mid-Atlantic; South Georgia; and Friday Harbor, Washington (collected from a medusa). The present records are the first for the Bermuda region.

This species appears to be very close to, if not identical with, *Hyperia galba* (Montagu). Barnard (1932, p. 274) concluded from evidence presented by the specimens which he examined that they were distinct, as Tattersall (1906, p. 22) had previously concluded from his studies of specimens taken off the coast of Ireland. I have figured the gnathopods, metasome and uropods of a male measuring about 16 mm., which, from the characters of the gnathopods and uropods, appears to be *Hyperia spinigera*. Tattersall states that the posterolateral angles of the third metasome segment are sharply pointed in *H. galba* and rounding in *H. spinigera*. In most of the Bermuda specimens the epimera of the metasome are very tumid and do not show clearly the lower and posterior margins, but in the specimen figured they were quite clearly defined. The third epimeron has a broadly rounding lower and posterior margin with a slight, pointed angle about the center of the curve. The gnathopods appear to resemble very closely the figures given by Bovallius (1889, pl. X, figs. 34-35).

Barnard (1932, p. 274) is of the opinion that *Hyperia antarctica* Spandl is synonymous with *H. spinigera* Bovallius.

The largest male in the present collection measures about 16 mm., and the females somewhat less.

Hyperioides longipes Chevreux.

Hyperioides longipes Chevreux, 1900, p. 143, pl. 17, fig. 2.

Hyperia sibaginis Vosseler, 1901, p. 60, pl. 7, figs. 6-20.

Hyperioides longipes Chevreux and Fage, 1925, p. 407, fig. 405.

Four specimens were taken at depths between 300 and 700 fathoms.

Distribution.—North Atlantic; tropical Atlantic; South Atlantic (37½° S.); East Indies; New Zealand (51° S., Barnard); Gulf of Aden; Mediterranean. It is new to the Bermuda region.

Hyperioides longipes is a small but widely distributed species, attaining a length of 5-6 mm. The Bermuda specimens, both male and female, are about 5 mm. in length.

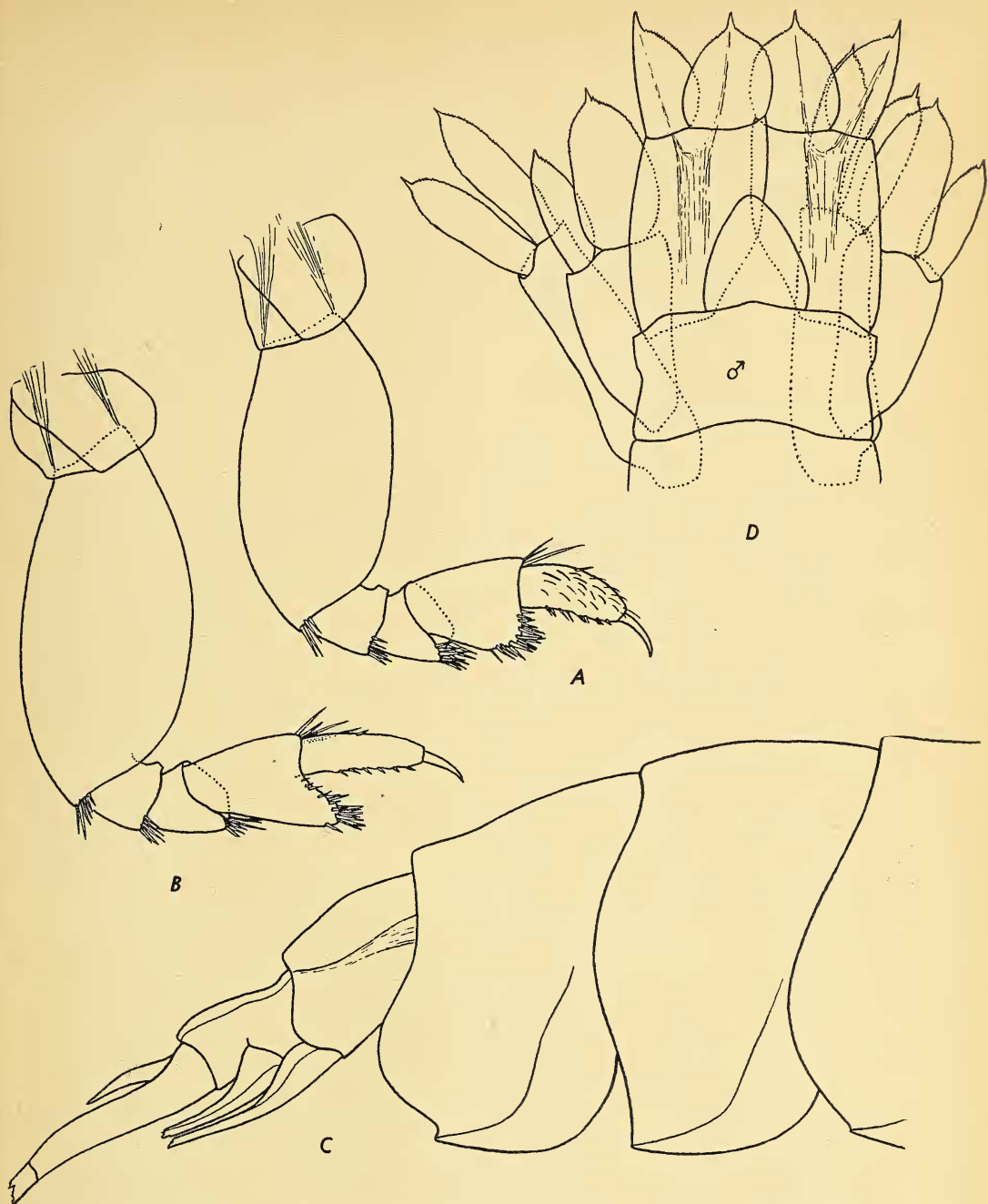
Iulopsis mirabilis Bovallius.

Text-figs. 36, 37.

Iulopsis mirabilis Bovallius, 1887c, p. 18.

Euiulopsis mirabilis Bovallius, 1889, p. 125, pl. 8, figs. 19-33.

Euiulopsis mirabilis Spandl, 1927, p. 159, figs. 4 l-m.



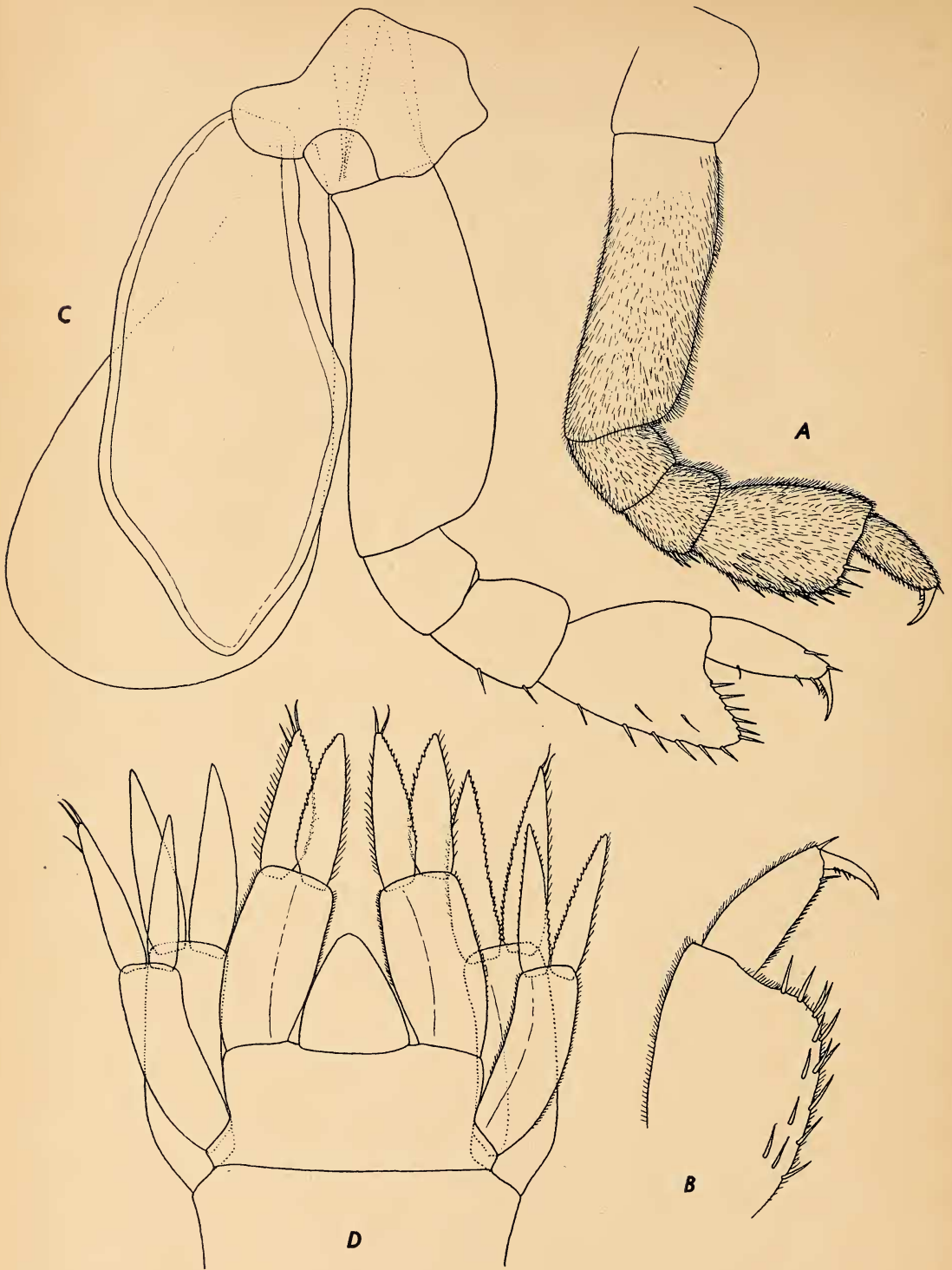
TEXT-FIG. 35. *Hyperia spinigera* Bovallius, male. **A**, gnathopod 1; **B**, gnathopod 2; **C**, metasome and urosome; **D**, uropods and telson.

Two female specimens were taken at depths of 700 and 800 fathoms.

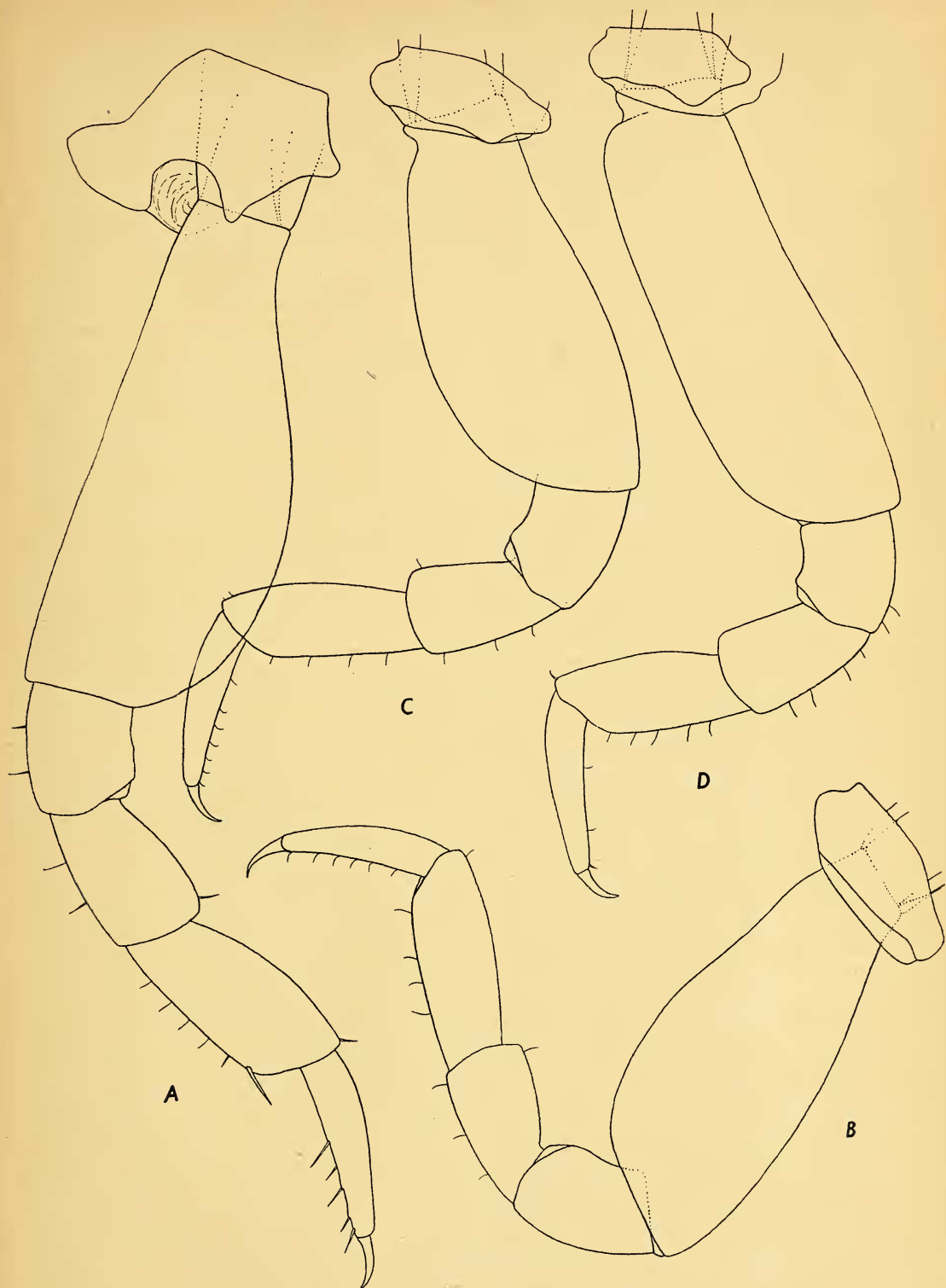
Distribution.—Bovallius described this species from the Bay of Panama in 1887, and it has not been recorded since until the two specimens of the present collection were procured at Bermuda.

Bovallius described *Iulopis loveni* from

the North Atlantic, but the present specimens do not appear to belong to that species. In most characters they agree very well with the figures given by Bovallius for *I. mirabilis*, as I have shown by my figures. Spandl (1927, p. 160) has figured the first and second gnathopods of a specimen of *I. mirabilis* which was identified by Bovallius



TEXT-FIG. 36. *Iulopsis mirabilis* Bovallius, female. **A**, gnathopod 1; **B**, end of gnathopod 1, enlarged; **C**, gnathopod 2; **D**, uropods and telson.



TEXT-FIG. 37. *Iulopis mirabilis* Bovallius, female. **A**, peraeopod 1; **B**, peraeopod 3; **C**, peraeopod 4; **D**, peraeopod 5.

and my figures of these gnathopods agree very well with his figures except that mine are somewhat stouter. Spandl, however, accidentally transposed the letters *l* and *m* on his figures. Bovallius figures a male, but Spandl does not state the sex or the size of the specimen from which his figures were made. It is possible that the appendages of the female are somewhat stouter than those of the male.

Bovallius states that the telson is narrower than the peduncle of the last pair of uropods and that it is considerably shorter than half the peduncle of the last pair of uropoda, but longer than half the last coalesced urol segment. These statements do not agree with the Bermuda specimens, where the telson is over half the length of the peduncles of the third pair of uropoda and also wider than these peduncles. The telson is not only longer than half the coalesced urol segment but is fully equal in length to it. Several of the rami of the uropods are tipped with two or three slender setae, and it is probable that all were so armed, but that they have been lost from most of the rami. The female figured measures between 5 and 6 mm., carries young in the marsupial pouch, and is covered with a very fine, dense, velvety pubescence. The second female appears also to be fully developed and measures a little over 6 mm.

As both *Iulopis loveni* and *I. mirabilis* have now been recorded from the North Atlantic, and taking into consideration the few specimens of this genus which have come to light, our lack of knowledge of the sex variations, and the apparent variability of at least some of the characters, it seems possible that these two species may prove to be synonymous.

I agree with Barnard (1930, p. 418) that there is no valid reason for altering the original spelling of the genus *Iulopis* to *Euiulopis* and that therefore the original name must be used.

***Phronimopsis spinifera* Claus.**

Phronimopsis spinifer Claus, 1879b, p. 64, pl. 1, figs. 1-3.

Phronimopsis sarsii Bovallius, 1887c, p. 23.

Phronimopsis tenella Stebbing, 1888, p. 1374, pl. 164.

Phronimopsis sarsii Bovallius, 1889, p. 320, pl. 14, figs. 1-29.

Phronimopsis spinifera Bovallius, 1889, p. 326, pl. 14, figs. 30-35.

Phronimopsis tumida Vester, 1900, p. 9, pl. 1-2.

Phronimopsis spinifera Chevreux and Fage, 1925, p. 408, fig. 406.

Five specimens were taken at depths between 100 and 900 fathoms.

Distribution. — *Phronimopsis spinifera*

has been recorded from the warm and temperate regions of the Atlantic, Pacific, and Indian Oceans, and the Mediterranean and Red Seas. It has not heretofore been recorded from the Bermuda region.

Several species of this genus have been described as shown by the synonymy, but these are all considered by the foremost authorities to be synonyms of *S. spinifera*.

This is a small species measuring between 3 and 4 mm. The present specimens are about 3.5 mm.

FAMILY LYCAEOPSIDAE.

***Lycaeopsis neglecta* Pirlot.**

Lycaeopsis zamboange Chevreux, 1913, p. 22, fig. 9 ♀.

Lycaeopsis neglecta Pirlot, 1929a, p. 144, fig. 8.

One specimen was taken at a depth of 100 fathoms.

Distribution.—Mediterranean; North Atlantic. This specimen from Bermuda constitutes the first record for the western part of the North Atlantic.

Chevreux identified and figured specimens from the Mediterranean as *Lycaeopsis zamboange* Stebbing. Pirlot in 1929 gave these specimens the new name, *Lycaeopsis neglecta*, as Chevreux's specimens were not *L. zamboange*. The *Armauer Hansen* took 19 specimens of this species in the eastern part of the North Atlantic (31° - 35° N., Pirlot). The Scientific Expeditions of the Prince of Monaco in the eastern part of the North Atlantic took 5 females in 1885 and 6 females and 1 young male in 1911.

This is a very small species, measuring between 2 and 4 mm. The present specimen is about 3.5 mm.

***Brachyscelus crusculum* Bate.**

Brachyscelus crusculum Bate, 1861, p. 7, pl. 2, figs. 1-2.

Brachyscelus crusculum Bate, 1862, p. 310, pl. 1, fig. 6.

Thamyris mediterranea Claus, 1887, p. 60, pl. 16, figs. 11-18.

Seven specimens were taken at depths between the surface and 900 fathoms.

Distribution.—North and South Atlantic; North Pacific; East Indies; Indian Ocean; and Mediterranean. These are the initial records of this species for Bermuda.

The largest female of the present collection measures 14 mm. and the largest male 10.5 mm.

***Brachyscelus globiceps* (Claus).**

Thamyris globiceps Claus, 1879a, p. 182.

Thamyris globiceps Claus, 1887, p. 59, pl. 16, figs. 1-2, 4-10.

Brachyscelus globiceps Stephensen, 1925, p. 176, fig. 65.

Five specimens were taken at depths between 25 and 900 fathoms.

Distribution.—Mediterranean; Zanzibar (Claus); Portuguese West Africa (Barnard); Arabian Sea (Barnard); Great Barrier Reef, Australia (Barnard). These present records from Bermuda are the first for the North Atlantic.

The largest specimen in the collection measures 6.5 mm.

***Brachyscelus macrocephalus* Stephensen.**

Brachyscelus macrocephalus Stephensen, 1925, p. 177, fig. 66.

One specimen was taken at a depth of 100 fathoms.

Distribution.—This species was described by Dr. Stephensen from specimens taken by the *Thor* in the Mediterranean. The present record is the second of the occurrence of the species and the first of its occurrence outside the Mediterranean.

The Bermuda specimen, a female, though slightly larger than the specimens taken by the *Thor*, agrees very well with Dr. Stephensen's description and figures. This female measures 6 mm. in length, while the largest of the *Thor* specimens was 5 mm.

***Lycaea pulex* Marion.**

Lycaea pulex Marion, 1874, p. 13, pl. 2, fig. 2.

Lycaea similis and *robusta* Claus, 1879a, pp. 185-186.

Lycaea similis Claus, 1887, p. 63, pl. 18, figs. 8-14.

Lycaea robusta Claus, 1887, p. 63, pl. 19, figs. 2-10.

Amphipronoe longicornuta Giles, 1887, p. 220, pl. 5.

Lycaea vincentii and *pulex* Stebbing, 1888, p. 1563, pl. 99; p. 1567.

Lycaea bovallii Chevreux, 1900, p. 157, pl. 18, fig. 3.

Lycaea gracilis Spandl, 1924b, p. 30, fig. 6.
Lycaea bajensis Shoemaker, 1925, p. 46, figs. 16, 17.

Lycaea pulex and *bovallioides* Stephensen, 1925, p. 167; p. 169, fig. 63.

Sixteen specimens were taken between the surface and 1,000 fathoms.

Distribution.—North and South Atlantic; North and South Pacific; Indian Ocean; and Mediterranean. The present records are the first for Bermuda.

Previous authors have considered *similis*, *robusta*, *longicornuta*, *gracilis* and *bajensis* to be synonyms of *pulex*. I believe that *vincentii*, *bovallii* and *bovallioides* should be added to this list. *L. pulex* is a very variable species and all of the species which are now considered synonyms appear to have been founded on variations of *pulex*.

The species *ochracea* Dana, *stebbingi* Bovallius and *pauli* Stebbing are not sufficiently described or figured for recognition.

***Lycaea serrata* Claus.**

Text-figs. 38, 39.

Lycaea serrata Claus, 1879a, p. 185.

Lycaea serrata Claus, 1887, p. 63, pl. 18, figs. 15-20.

Three specimens were taken at depths between 200 and 900 fathoms.

Distribution.—This species was described by Claus from the Bay of Bengal from the male. In 1910 the *Thor* took five males in the Mediterranean (Stephensen 1925, p. 168). The present specimens, two males and a female, from Bermuda are first to be recorded from the Atlantic.

The female of this species has not heretofore been recorded, and, as it does not bear a very close resemblance to the male, I have figured it and given a short description.

Head very large and covered by the eyes except for a narrow median area. Body very much swollen with the mesosome very high and broad. Mesosome somewhat broader than long, with the segments elevated and some of them separated by a membranous depression. Metasome very much narrower than the mesosome, and each segment ending dorsally in a blunt posterior projection. The first five coxal plates produced forward.

Gnathopods 1 and 2 much like those of the male, but the second joint apparently more expanded. Peraeopods 1 and 2 much like those of the male; sixth joint somewhat expanded, but narrowing rather abruptly distally; seventh joint short and blunt. Peraeopod 3 the longest; second joint little expanded; fourth and fifth joints normal, not expanded as in the male; sixth and seventh joints like those of peraeopods 1 and 2. Peraeopod 4 like that of the male with second joint expanded. Peraeopod 5 as in the male, except that perhaps the third to sixth joints are more degenerate, the seventh joint being entirely absent. Uropods and telson as in the male. Length of ovigerous female 10.5 mm. Male 8 mm.

***Tryphana malmii* Boeck.**

Tryphana malmii Boeck, 1870, p. 9.

Tryphana malmii Boeck, 1872, p. 92, pl. 1, fig. 3.

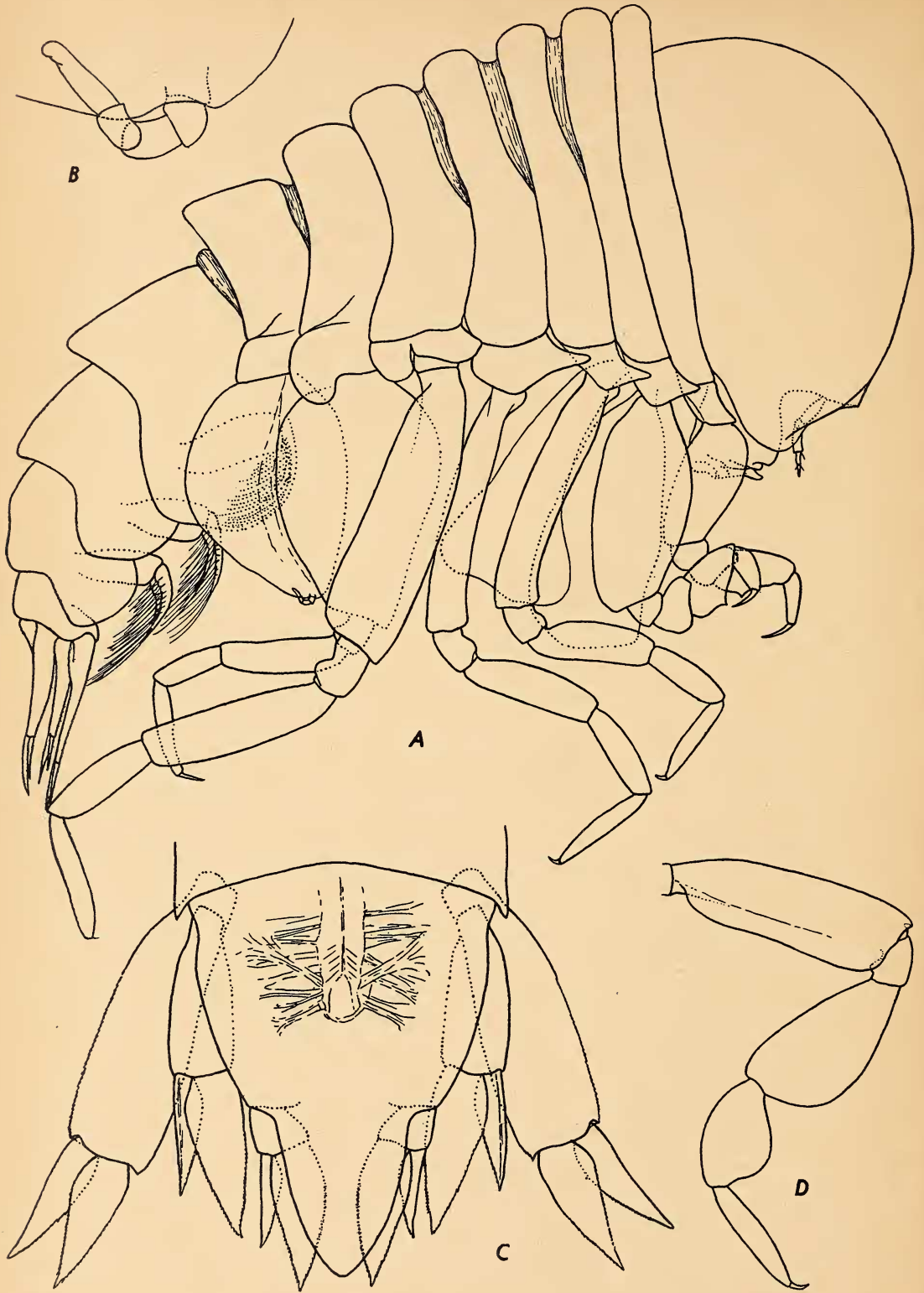
Tryphana boeckii Stebbing, 1888, p. 1539, pl. 194.

Tryphaena malmi Sars, 1895, p. 17, pl. 7.

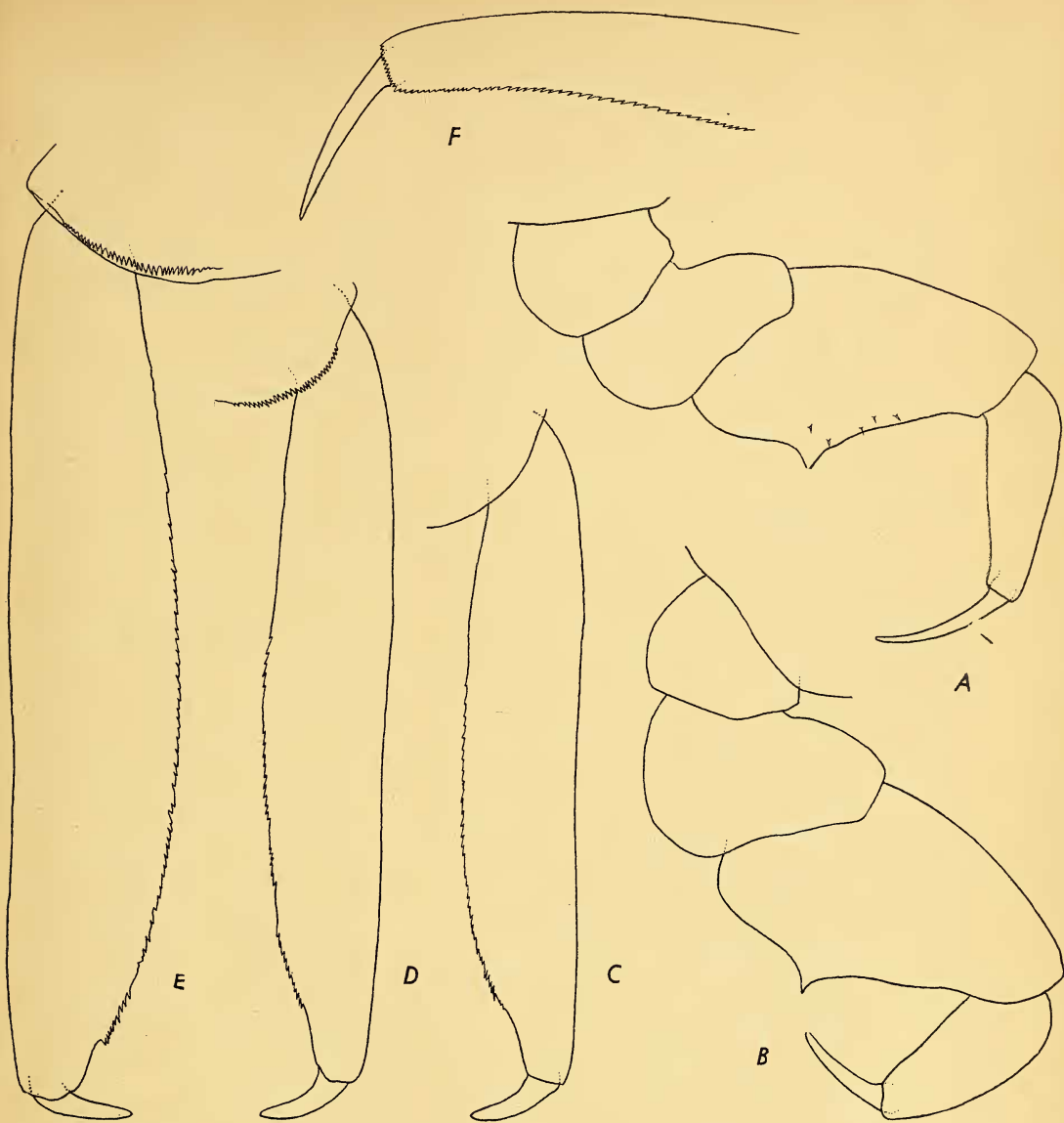
Twelve specimens were taken at depths of 100 and 300 fathoms.

Distribution.—*Tryphana malmii* was not known outside the North Atlantic until Barnard recorded it from New Zealand in 1930. The present Bermuda records are the first for the western part of the North Atlantic.

This species attains a length of 4 or 5 mm. The largest specimen from Bermuda is about 4 mm.



TEXT-FIG. 38. *Lycaea serrata* Claus, female. **A**, entire animal; **B**, end of peraeopod 5; **C**, uropods and telson; male, **D**, peraeopod 3.



TEXT-FIG. 39. *Lycaea serrata* Claus, female. **A**, gnathopod 1; **B**, gnathopod 2; **C**, pereopod 1; **D**, pereopod 2; **E**, pereopod 3; **F**, pereopod 4.

FAMILY PRONOIDAE.

Eupronoë maculata Claus.

Eupronoë maculata Claus, 1879a, p. 174 (28).

Eupronoë maculata Claus, 1887, p. 52, pl. 13, figs. 1-6.

Eupronoë inscripta Stebbing, 1888, p. 1510, pl. 187.

Six specimens were taken at depths of 50 and 1,000 fathoms.

Distribution.—North and South Atlantic; North and South Pacific; Indian Ocean; and

Mediterranean. The present records are the first for Bermuda.

The largest specimen in the Bermuda material is about 7.5 mm.

Eupronoë minuta Claus.

Eupronoë minuta Claus, 1879a, p. 174 (28).

Eupronoë minuta Claus, 1887, p. 53, pl. 14, figs. 7-12.

Eupronoë minuta Chevreux and Fage, 1925, p. 425, fig. 417.

Nineteen specimens were taken at depths between 100 and 1,000 fathoms.

Distribution.—North Atlantic; Mediterranean; Indian Ocean (Stebbing, *Challenger Rep.*, p. 1516, 40° 3' S., 132° 58' W.); East Indies; New Zealand; Pacific (37° 37' N., 163° 26' W., *pacifica*, Stebbing, *Challenger Rep.* p. 1513). It is new to the North Atlantic.

Eupronoë minuta reaches a length of 4.5 or 5 mm. The Bermuda specimens are about 3.5 mm. Barnard regards *E. pacifica* Stebbing as a young male of *E. minuta*. He is probably correct in believing it synonymous with *E. m.*, but Stebbing's specimen measured about one-fifth of an inch, which is about equal to 5 mm. Barnard's male of *minuta* measured only 4.5 mm., so it would seem that the specimen of *pacifica* was not likely juvenile.

Parapronoë crustulum Claus.

Text-figs. 40, 41.

Parapronoë crustulum Claus, 1879a, p. 177 (31).

Parapronoë atlantica Bovallius, 1887a, p. 42.

Parapronoë crustulum Claus, 1887, p. 55, pl. 15.

Parapronoë crustulum Stebbing, 1888, p. 1530, pl. 193A.

Parapronoë campbelli Stebbing, 1888, p. 1522, pl. 189.

Parapronoë clausi Stebbing, 1888, p. 1526, pl. 190.

Parapronoë clausoides Stebbing, 1888, p. 1229, pl. 191.

Parapronoë similis, *stebbingi*, and *crustulum* Spandl, 1927, p. 219, fig. 38; p. 220, fig. 39; p. 221, fig. 40.

Nineteen specimens were taken at depths between 100 and 1,000 fathoms.

Distribution.—*Parapronoë crustulum* has, under its several synonyms, been recorded from the North and South Atlantic; North Pacific; South Pacific (New Zealand, Australia and East Indies); and the Indian Ocean. The present records are the first from Bermuda.

Many species of *Parapronoë* have been described, but recent authors regard a number of them as synonyms of the earlier species *crustulum*. The last to be added to this list of synonyms is *campbelli* Stebbing, which is regarded by Pirlot as only an immature form of *crustulum* (1939, p. 52).

P. crustulum reaches a length of 20 mm., and the specimens from Bermuda range between 10 and 19 mm.

I have figured a female measuring 19 mm. which appears to be the form described and figured by Stebbing as *clausoides*. Barnard has figured the second joint of the fourth peraeopod of the same form (1932, fig. 165). The distal lobe on the fourth joint of this peraeopod is of about the same proportionate length as shown in

Stebbing's figure (1888, p. 191). The serrations on the distal front margin of the second joint of the fourth peraeopod are a very variable character; in the specimen figured they are very prominent, but in others they are small and obscure, while in still others they are absent altogether. The serrations on the gnathopods also appear to be quite variable. The hind margin of the fifth joint of gnathopod 1 bears very fine serrations distally.

All the specimens bear two small terminal joints on the fifth peraeopods. The uropods and telson are variable in character, but more or less conform to the pattern figured by Stebbing for *clausoides* rather than to that figured by him for *crustulum*.

Sympronoë parva (Claus).

Parapronoë parva Claus, 1879a, p. 177 (31).

Parapronoë parva Claus, 1887, p. 55, pl. 14, figs. 13-18.

Sympronoë parva Stebbing, 1888, p. 1533, pl. 192.

Sympronoë parva and *parva* var. *7-articulata* Stephensen, 1925, p. 162, figs. 59, 60.

Sympronoë anomala Shoemaker, 1925, p. 42, figs. 14, 15.

Sympronoë parva and *parva septemarticulata* Pirlot, 1930, p. 32; 33.

Forty-four specimens were taken at depths between the surface and 500 fathoms.

Distribution.—North and tropical Atlantic; North Pacific; East Indies; Indian Ocean; Mediterranean. It has not heretofore been recorded from Bermuda.

This is a rather small species, measuring about 6 or 7 mm.

FAMILY OXYCEPHALIDAE.

Oxycephalus piscator Milne-Edwards.

Text-figs. 42, 43.

Oxycephalus piscatoris Milne-Edwards, 1830, p. 396.

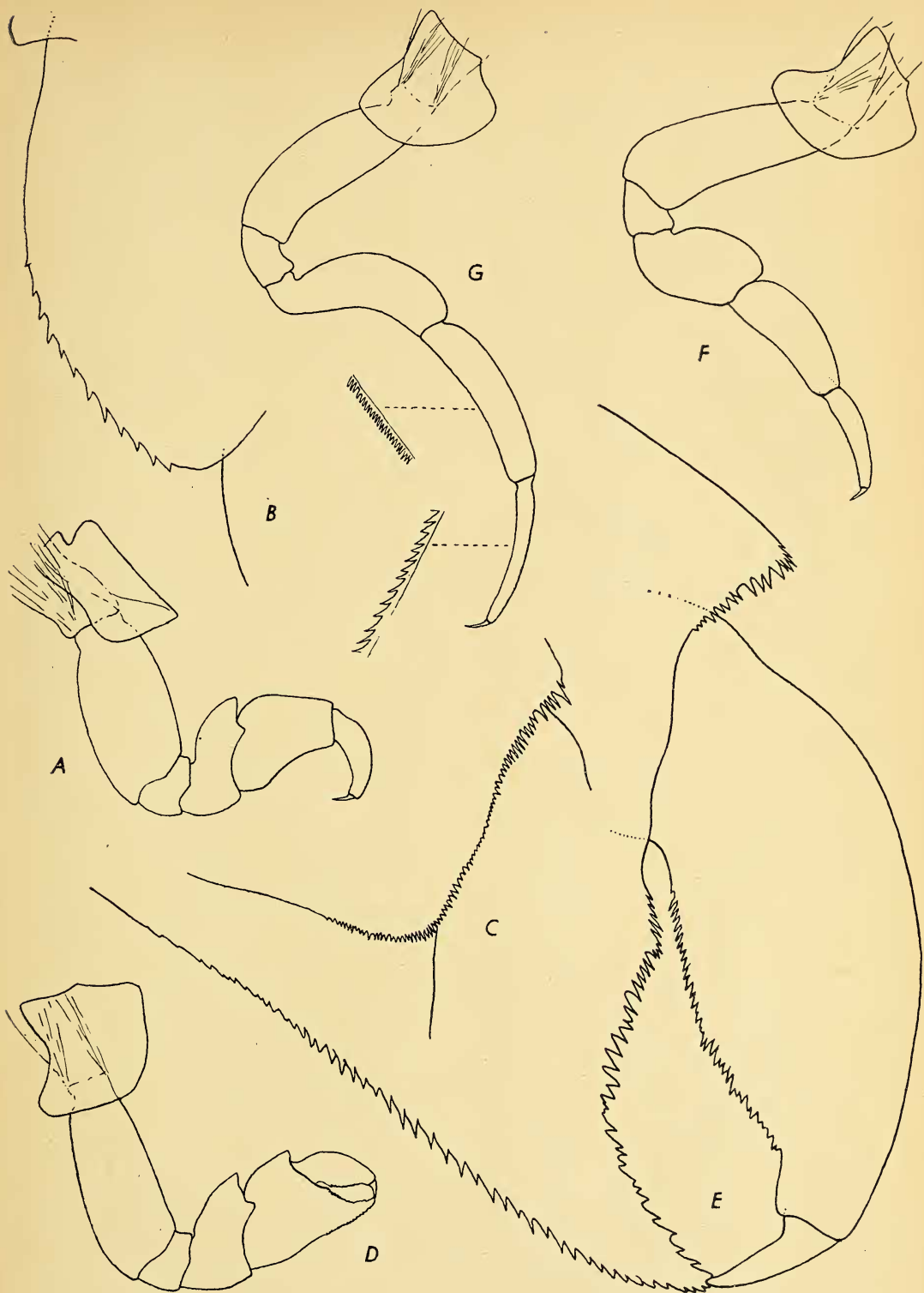
Oxycephalus piscator Bovallius, 1890, p. 56, pl. 1, figs. 8-16, text-figs. 33, 35, 36, 37, 41, 42, 66, 68, 69, 75 (literature and synonymy).

Oxycephalus piscator Spandl, 1927, p. 180, fig. 13.

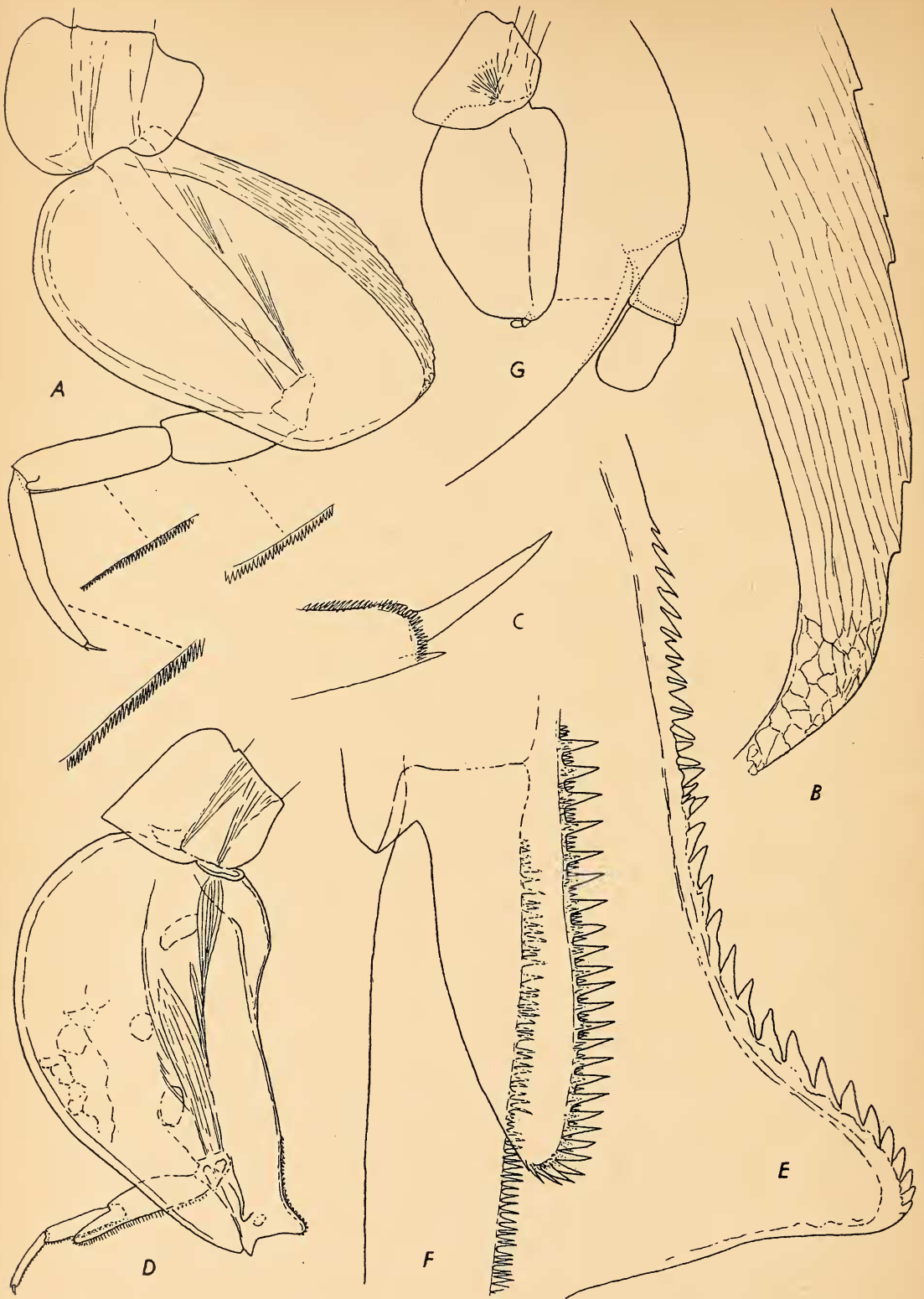
One specimen, a female, was taken at a depth of 800 fathoms.

Distribution.—North Atlantic (41° N., Chevreux), tropical Atlantic, and South Atlantic; subtropical and tropical Pacific; New Zealand (Barnard); Indian Ocean; and Mediterranean.

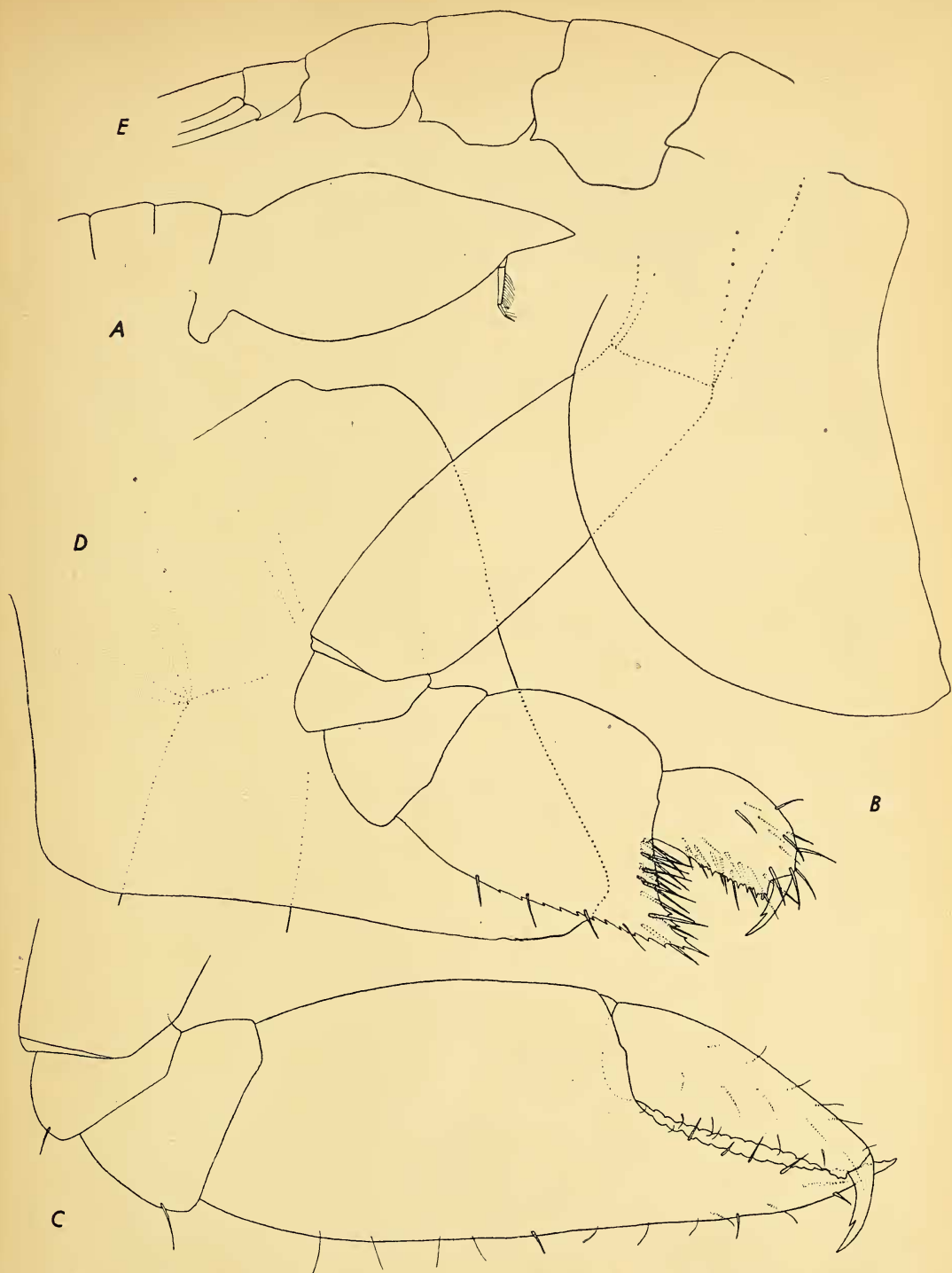
I have identified this single female as *Oxycephalus piscator* M.-E., as it appears to agree in most characters with the description given by Bovallius (1890, p. 64). As the figures given by different authors do not



TEXT-FIG. 40. *Parapronoë crustulum* Claus. **A**, gnathopod 1; **B**, hind margin of fourth joint of gnathopod 1; **C**, serrate distal margin of fifth joint of gnathopod 1; **D**, gnathopod 2; **E**, end of gnathopod 2 enlarged; **F**, pereopod 1; **G**, pereopod 2.



TEXT-FIG. 41. *Parapronoë crustulum* Claus. **A**, peraeopod 3; **B**, lower front margin of second joint of peraeopod 3; **C**, sixth and seventh joints of peraeopod 3; **D**, peraeopod 4; **E**, lower front margin of second joint of peraeopod 4; **F**, lower front margin of fourth joint, and upper front margin of fifth joint of peraeopod 4; **G**, peraeopod 5.

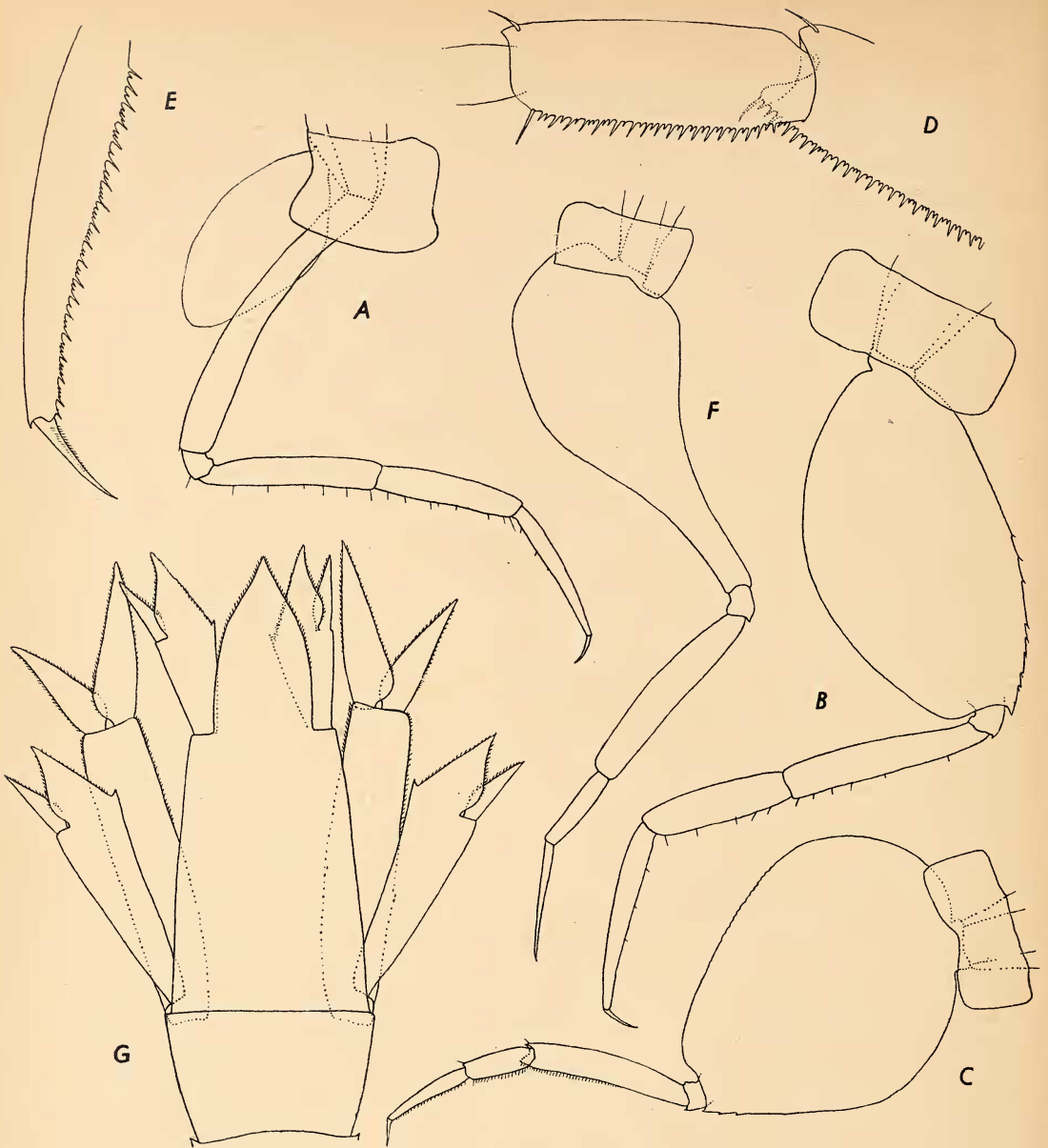


TEXT-FIG. 42. *Oxycephalus piscator* M. Edw., female. **A**, head; **B**, gnathopod 1; **C**, gnathopod 2; **D**, coxal plate 2; **E**, metasome.

agree in some characters, I have figured the present female with the hope that it may help to clear up some of these difficulties.

The head is deeper from top to bottom than is shown by Claus or Bovallius. The

first gnathopods do not have the slight projecting keel at the distal corner of the upper margin of the fifth joint as figured by Spandl (1927, p. 180, fig. 13a). Bovallius mentions a slight keel in his description,



TEXT-FIG. 43. *Oxycephalus piscator* M. Edw., female. **A**, peraeopod 1; **B**, peraeopod 3; **C**, peraeopod 4; **D**, fourth and fifth joints of peraeopod 4; **E**, sixth and seventh joints of peraeopod 4; **F**, peraeopod 5; **G**, uropods and telson.

but does not show it in his figure (1890, pl. 1, fig. 11) which, however, is of the male. In the second gnathopod the fifth joint appears to be proportionately longer than in either the figures of Bovallius or Spandl. The second joint of the fourth peraeopod is proportionately wider than is figured by Claus or Bovallius. Bovallius does not state that the sixth joint of this peraeopod, as well as the fourth and fifth, is serrate, but the present specimen is thus armed, and Spandl has figured this joint as being serrate. The

greatest discrepancy, perhaps, lies in the fifth or last peraeopod. In the present specimen the second joint of this peraeopod is expanded above and quickly narrows down until the distal third is no wider than the following joints. This sudden narrowing does not occur in Bovallius's figure (1890, pl. 1, fig. 14), or in the figure of Spandl (1927, p. 180, fig. 13d). This peraeopod, however, in many of the hyperiids appears to be undergoing degeneration so that too much dependence cannot be placed upon it as a reliable character.

The first three metasome segments do not agree with the figures of either Claus or Bovallius. They approach somewhat those of the figure of a young male given by Bovallius (1890, pl. 1, fig. 9), but are quite unlike those of the figure of the female given by Claus (*O. similis*, 1887, pl. 23, fig. 9) (Bovallius 1890, pl. 1, fig. 10). The description of these three segments given by Bovallius does not agree with Claus's figure. I have figured the metasome of the Bermuda specimen so that the characters of the first three segments may be clearly seen.

Bovallius says that the peduncle of the first uropod is a little longer than the inner ramus, but in the present specimen it is nearly twice as long. In the figure given by Bovallius (1890, p. 39, fig. 75) the peduncle of the second uropod is considerably less than twice the length of the inner ramus, but in the Bermuda specimen it is over twice the length of the inner ramus.

The length of this species is given by Bovallius as 14-20 mm., but Stephensen records a female 25 mm. and Barnard a male 27 mm. The female from Bermuda measures about 17 mm.

Oxycephalus clausi Bovallius.

Oxycephalus piscator Claus, 1887, p. 69, pl. 22, figs. 1-9, pl. 23, figs. 1-8.

Oxycephalus clausi Bovallius, 1887c, p. 35.

Oxycephalus clausi Stebbing, 1888, p. 1583, pl. 202.

Oxycephalus clausi Bovallius, 1890, p. 60, pl. 1, figs. 19-24; pl. 2, fig. 1; p. 21, fig. 4; p. 22, figs. 7 and 8, p. 25, fig. 22; p. 33, fig. 54; p. 36, fig. 65.

Oxycephalus clausii, erythraeus, and *manicini* Cecchini, 1929, p. 5-7, pl. 1-3.

Twenty specimens were taken at depths between 25 and 1,000 fathoms.

Distribution.—This is a very widely distributed species, having been recorded from the North, tropical and South Atlantic; North, tropical and South Pacific; Indian Ocean; and Mediterranean. It has not heretofore been recorded from the Bermuda region, but there are specimens in the National Museum taken by the steamer *Albatross* at Station 2096 (39° 22' 20" N., 70° 52' 20" W.) and by the steamer *Grampus* at Station 10218 (40° 06' N., 68° 06' W.).

The largest females from Bermuda measure about 30 mm., but Barnard records a female from the Southeast Atlantic which measured 36 mm. The males are smaller than the females.

Calamorrhynchus pellucidus Streets.

Calamorrhynchus pellucidus Streets, 1878, p. 285, fig. 5.

Calamorrhynchus rigidus Stebbing, 1888, p. 1600, pl. 206.

Calamorrhynchus pellucidus Bovallius, 1890, p. 73, pl. 2, figs. 14, 15.

Twelve specimens were taken at depths between 50 and 1,000 fathoms.

Distribution.—North and South Atlantic; North Pacific; East Indies; Indian Ocean; and Mediterranean.

Many authors have suspected the identity of *C. pellucidus* and *C. rigidus*, but Pirlot (1938, p. 371) made them synonymous and I believe he was correct in so doing. The distinctions between these two species are all based on more or less variable characters. The length of *pellucidus* was given as 12 mm., while that of *rigidus* was given as nine-tenths of an inch or 23 mm. Stephensen records a female with ova measuring 18 mm. from the North Atlantic (31° 23' N.). The largest female in the present collection is 15 mm., and these specimens constitute the first record of the occurrence of this species in the Bermuda region.

Cranoecephalus scleroticus (Streets).

Text-fig. 44.

Oxycephalus scleroticus Streets, 1878, p. 281, pl. II, fig. 3, 3a-c.

Oxycephalus typhoides Claus, 1879a, p. 195.

Oxycephalus typhoides Claus, 1887, p. 72, pl. 24, figs. 11-14.

Cranoecephalus goësi Bovallius, 1890, p. 95, pl. IV, figs. 7-9; p. 21, fig. 5; p. 32, fig. 53; p. 38, fig. 72 (male adult).

Stebbingella sclerotica Bovallius, 1890, *Ibid.*, p. 98, pl. IV, figs. 13-16.

Stebbingella typhoides Bovallius, 1890, *Ibid.*, p. 100, pl. IV, figs. 10-12; p. 27, fig. 30.

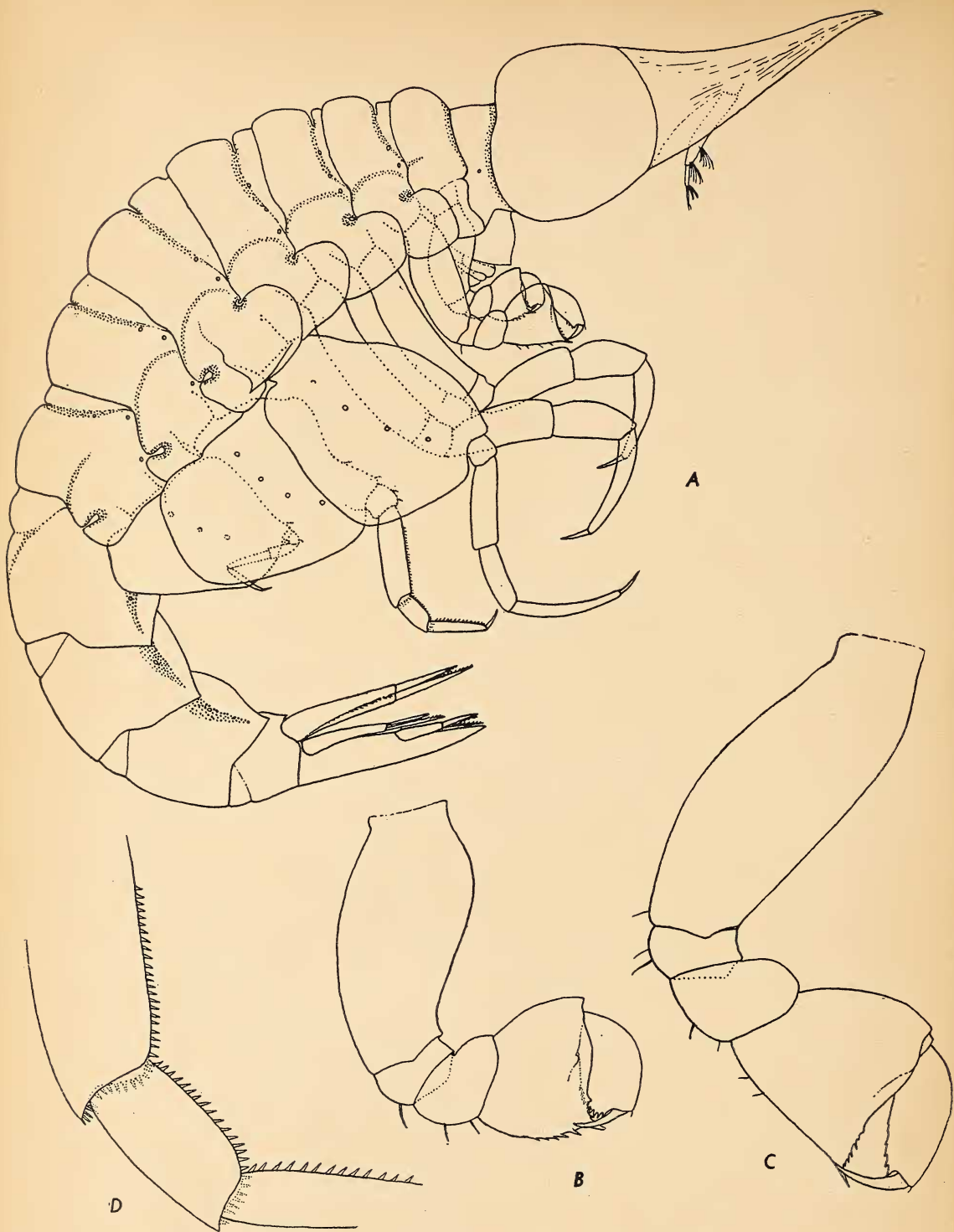
Stebbingella théeli Bovallius, 1890, *Ibid.*, p. 101, pl. V, figs. 1-4; p. 21, fig. 3; p. 35, fig. 60.

Stebbingella typhoides? Stephensen, 1925, p. 199, fig. 76.

One specimen, a female, was taken at a depth of 600 fathoms.

Distribution.—This species was described from the North Pacific between the Hawaiian Islands and Lower California. *Oxycephalus typhoides* was described from Zanzibar and the Mediterranean. *Cranoecephalus goësi* was described from the tropical regions of the Atlantic. *Stebbingella théeli* came from the Indian Ocean. Stephensen recorded *Stebbingella typhoides* from the North Atlantic (32° 10' N., 17° 20' W.) and the Mediterranean. Spandl's record was from the South Atlantic (19° S., 20° W.). Pirlot in 1929 recorded *S. typhoides* from off the coast of Portugal. In 1938, Pirlot recorded *Cranoecephalus typhoides* from the Sulu Archipelago; and in 1939 he recorded it from Angola. The present record is the first from the western North Atlantic.

Oxycephalus typhoides Claus, *Cranoecephalus goësi* Bovallius, and *Stebbingella théeli* Bovallius all appear to me to be synonyms of



TEXT-FIG. 44. *Cranocephalus scleroticus* (Streets), female. **A**, entire animal; **B**, gnathopod 1; **C**, gnathopod 2; **D**, fourth, fifth, and sixth joints of pereopod 4.

Oxycephalus scleroticus Streets. Streets's figures, though very small, show many characters quite correctly. None of the figures of the early authors shows much

detail, so that much is left to be supplied by the imagination. But it appears to me that the figures of the above mentioned species given by their authors have enough

in common to be considered as one and the same species.

Stephensen says of *Stebbingella typhoides* (1925, p. 199), "The epimeral plates of pereopods 1 and 2 seem to be totally coalesced with the corresponding body segments, the three hindermost of which, however, send out a free wing in a posterior direction." In the Bermuda female, as my figure shows, coxal-plate 1 appears to be free, while plates 2-7 are coalesced with their respective body segments. Though all traces of the sutures have disappeared, their original positions are clearly indicated by the deep indentations on the front and hind margins of the body segments. The conspicuous backward-pointing tooth is present on the fifth segment. The metasome, urosome, uropods and telson are as figured by Bovallius for the male of *Stebbingella thééli* (1890, pl. V, fig. 4.).

Bovallius gives 15-21 mm. as the length of *Stebbingella thééli*, while the female from Bermuda is between 9 and 10 mm., which is a trifle longer than the specimens of *S. typhoides* examined by Stephensen, but is about the same as given by Streets for *O. scleroticus*. Notwithstanding the discrepancy in size, my female and the figure of the male of *S. thééli* given by Bovallius (1890, pl. V, fig. 1) show similar characters, except those distinguishing the sexes. Stephensen's figures of *S. typhoides* (1925, p. 200, fig. 76) show practically the same characters. I have carefully figured the Bermuda female so as to clearly show its characters, which may be readily compared with the figures of Streets, Claus and Bovallius. Claus's figure of *O. typhoides* (1887, pl. 24, fig. 11) is so lamentably lacking in detail that one has to rely chiefly on the general form of the animal for comparison.

Pirlet believes that *Oxycephalus bulbosus* Streets may also be synonymous with *S. typhoides*, but Streets's figures of the head and second gnathopod are so different from those of the species under discussion that I cannot accept his view.

***Glossocephalus milne-edwardsi* Bovallius.**

Text-fig. 45.

Glossocephalus milne-edwardsi Bovallius, 1887c, p. 35.

Glossocephalus spiniger Bovallius, 1887c, p. 35.

Elsia indica Giles, 1888, p. 250, pl. 6, figs. 2-4.

Glossocephalus milne-edwardsi Bovallius, 1890, p. 106, pl. 5; p. 22, fig. 6, 6a; p. 38, fig. 71.

Glossocephalus spiniger Bovallius, 1890, p. 108, pl. 5, figs. 6-9; p. 26, fig. 26; p. 29, fig. 43.

Glossocephalus adriaticus Steuer, 1911b, p. 682, pl. 3.

Two specimens, male and female, were taken at depths of 100 and 200 fathoms.

Distribution.—North and South Atlantic; South Pacific; Indian Ocean; Mediterranean; and Red Sea. The present records are the first for the Bermuda region.

As seen from the synonymy, this widely distributed species has been described under several specific names, but they are all now considered synonyms of the original *G. milne-edwardsi*. I have figured the female and some parts of the male in order to show wherein they differ from the previously published figures of this species. The sexes appear to bear a close resemblance to each other, even in the shape of the head. The head of the male figured by Bovallius (1890, pl. 5, fig. 5) is quite different from the head of the male which I have figured. His male measured 17 mm. while mine measures about 11 mm., and this difference in size and maturity may account for the difference in shape of the heads of the two males. The head of both the male and female in side view is produced to a sharp angle and not rounded as Bovallius shows for the female of *G. spiniger* (1890, pl. 5, fig. 6). The lower posterior angles of the three metasome segments in the male are produced and similar to those of the female, and not rounding as shown by Bovallius in his figure of *G. milne-edwardsi* (1890, pl. 5, fig. 5).

***Leptocotis tenuirostris* (Claus).**

Oxycephalus tenuirostris Claus, 1871, p. 155.

Leptocotis spinifera Streets, 1878, p. 283, pl. 2, fig. 4.

Oxycephalus tenuirostris Claus, 1887, p. 71, pl. 24, fig. 2.

Leptocotis tenuirostris Bovallius, 1887c, p. 38.

Leptocotis ambobus Stebbing, 1888, p. 1594, pl. 205.

Dorycephalus lindstromi Bovallius, 1890, p. 76, pl. 2, figs. 16-18; pl. 3, fig. 1, and p. 27, fig. 31; p. 29, figs. 39, 44; p. 33, fig. 56; p. 38, fig. 73; p. 39, fig. 77.

Leptocotis tenuirostris Stephensen, 1925, p. 191, fig. 74 (literature).

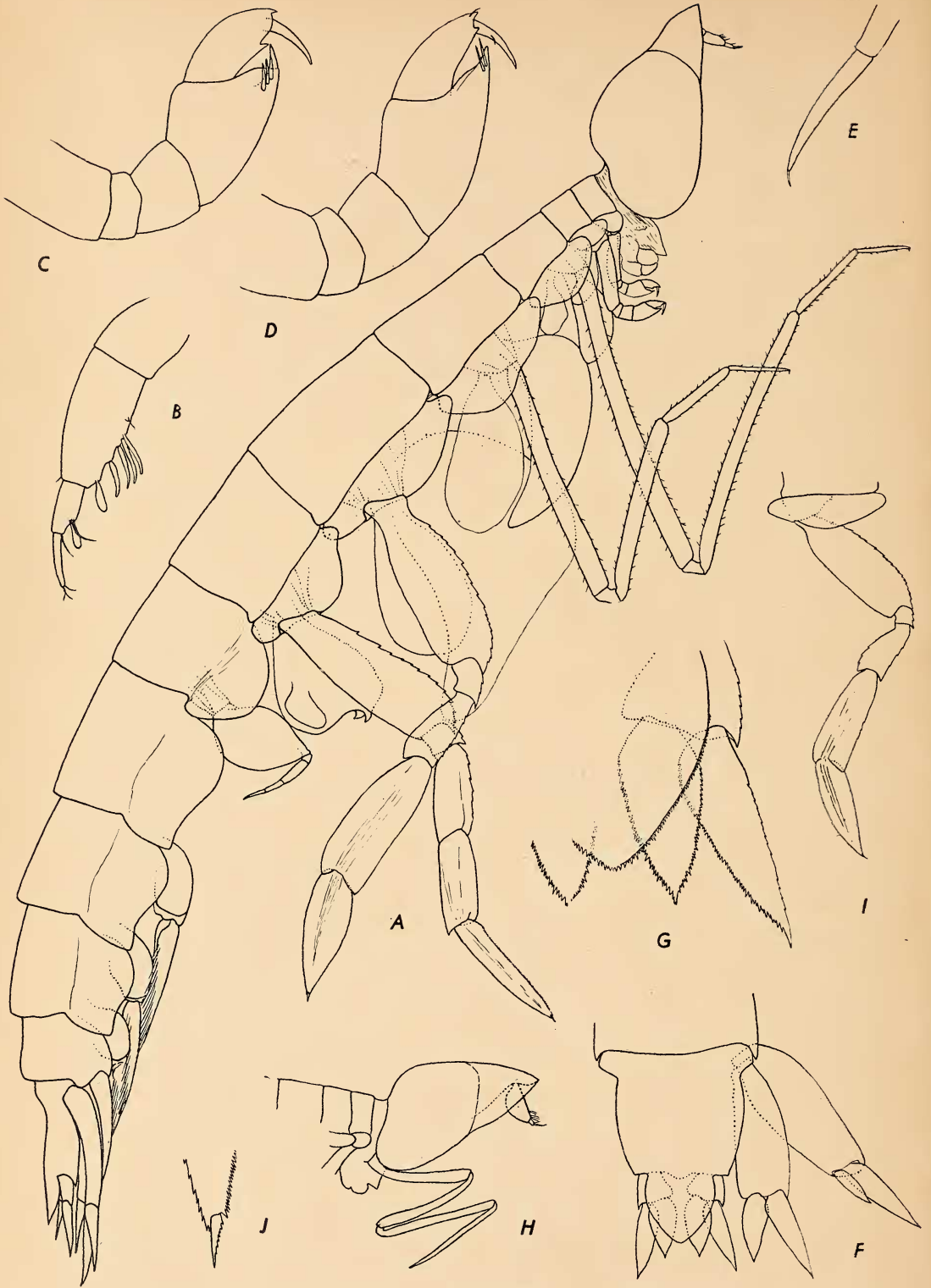
Dorycephalus ambobus Spandl, 1927, p. 203, fig. 28a-c.

Two male specimens were taken at depths of 100 and 900 fathoms.

Distribution.—This is a widely distributed species, having been recorded from the North and South Atlantic; Pacific; East Indian region; and Indian Ocean.

The measurements of *L. tenuirostris* have been given as 10-13 mm. The present specimens, which are both males, measure about 8 mm.

The Bermuda specimens agree very well with Claus's figure (1887, pl. 24, fig. 2) except in the first and second metasome seg-



TEXT-FIG. 45. *Glossocephalus milne-edwardsii* Bovallius, female 14 mm. in length. **A**, entire animal; **B**, antenna 1; **C**, gnathopod 1; **D**, gnathopod 2; **E**, end of peraeopod 5; **F**, uropods and telson; **G**, uropod 3 and telson greatly enlarged; male, **H**, head; **I**, peraeopod 4; **J**, end of sixth joint of peraeopod 4 showing the small seventh joint.

ments, the lower hind corners of which are bluntly angular and not broadly rounding. The third metasome segment is sharply and narrowly produced as in Claus's figure.

***Streetsia challengeri* Stebbing.**

Streetsia challengeri Stebbing, 1888, p. 1603, pl. 207.

Streetsia washingtoni Senna, 1902, p. 15, pl. 2.

Streetsia challengeri Stephensen, 1925, p. 194, fig. 75 (and literature).

Fifteen specimens were taken at depths between 50 and 900 fathoms.

Distribution.—This species was described by Stebbing from northeast of the Hawaiian Islands (35° N., 150° E.). It has since been recorded from the North and South Atlantic; South Pacific; Indian Ocean; Arabian Sea; and the Mediterranean. It has not heretofore been recorded from the Bermuda region.

This is a large, handsome species, Stebbing giving the length as a little over an inch. Barnard, however, records a specimen from the mid-Atlantic measuring 44 mm. The specimens of the present collection are all females, the largest measuring about 27 mm.

***Streetsia porcella* (Claus).**

Oxycephalus porcellus Claus, 1879a, p. 48.

Oxycephalus porcellus Claus, 1887, p. 72, pl. 24, figs. 7-9.

Oxycephalus porcellus Stebbing, 1888, p. 1587 (spec. A), pl. 203.

Streetsia porcella Bovallius, 1890, p. 83, pl. 4, figs. 4-6.

Five specimens were taken at depths from 50 to 1,000 fathoms.

Distribution.—*Streetsia porcella* was described by Claus from Zanzibar. It has since been recorded from the North and South Atlantic; Mediterranean; Sea of Japan (Stephensen, 1925, p. 194); New Zealand; and the Arabian Sea. The present records are the first for the Bermuda region.

Stephensen recorded a female from the Mediterranean 18 mm. in length which appears to be the largest so far taken. The largest specimens from Bermuda are about 14 mm. in length.

***Rhabdosoma whitei* Bate.**

Rhabdosoma whitei Spence Bate, 1862, p. 345, pl. 54, fig. 7.

Xiphocephalus whitei Walker, 1909b, p. 55.

Rhabdosoma whitei Stephensen, 1925, p. 207 (and literature).

Rhabdosoma whitei Spandl, 1927, p. 208, fig. 31.

One specimen was taken at a depth of 50 fathoms.

Distribution.—This species has been recorded from the North and South Atlantic; North and South Pacific; the Indian Ocean; and the Mediterranean. The present records are the first for the Bermuda region.

This is a large species. Stephensen records a male from the Northeast Atlantic measuring 53 mm. and a female from the same region 45 mm. The single specimen, a male, in the present collection, measures 55 mm., which appears to be the largest so far recorded.

***Rhabdosoma brevicaudatum* Stebbing.**

Rhabdosoma brevicaudatum Stebbing, 1888, p. 1612, pl. 208.

Rhabdosoma brevicaudatum Stephensen, 1925, p. 205, figs. 79, 80.

Four female specimens were taken at the surface and at 25 fathoms.

Distribution.—This species was described by Stebbing from a single female taken by the *Challenger* off the west coast of Africa (10° 55' N., 17° 46' W.). It has since been recorded from the Northeast Atlantic and the Mediterranean. It has not heretofore been recorded from the Bermuda region.

Stebbing's specimen measured in an outstretched position four-fifths of an inch, but the rostrum was not entire. A female recorded by Barnard measured 23 mm. with the tip of the rostrum broken off. A female with a perfect rostrum from Bermuda measures in an outstretched position 32 mm. Dr. Stephensen records a young male from the *Thor* material, and says that as far as he knew a mature male has never been taken.

FAMILY PLATYSCOLIDAE.

***Platyscelus armatus* var. *inermis* (Claus).**

Text-fig. 46.

Eutyphis armatus Claus, 1879a, p. 156 (10).

Eutyphis armatus Claus, 1887, p. 36, pl. 2, fig. 3-15.

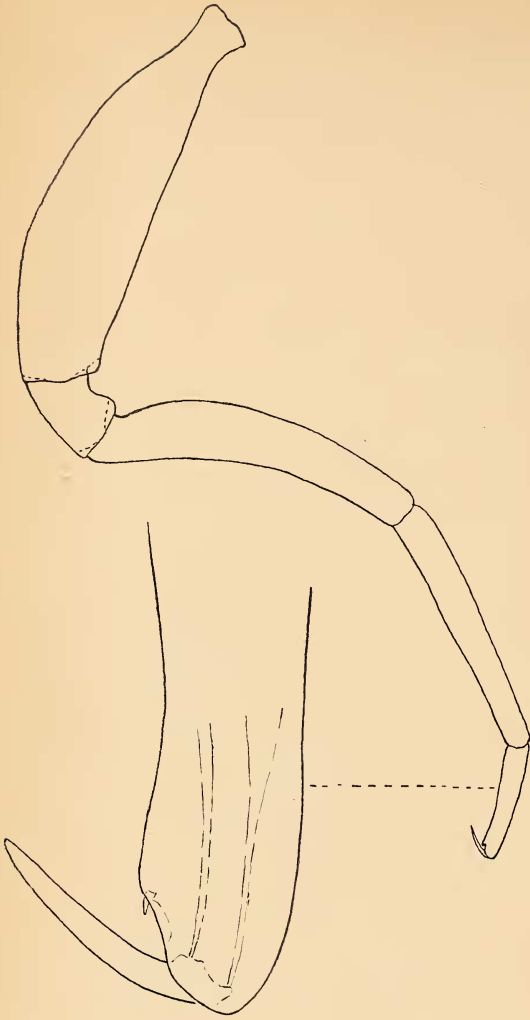
Eutyphis inermis Claus, 1887, p. 37.

Seven specimens, male and female, were taken at depths between 100 and 1,000 fathoms.

Distribution.—North and South Atlantic; North Pacific; South Pacific (Coast of Chile, Claus); Indian Ocean. The present records are the first for the western North Atlantic.

The females from Bermuda measure 15 mm. and the males about 10 mm., which seem to be the largest specimens of the variety *inermis* yet recorded.

The first and second pereopods of *armatus* are quite different from those of *ovoides*. The sixth joint is less than half as long as the fifth and is slightly subchelate, having a very short oblique palm defined by a spine; the second joint is very little expanded.



TEXT-FIG. 46. *Platyscelus armatus* var. *inermis* (Claus). Pereopod 1.

***Platyscelus ovoides* (Claus).**

Text-figs. 47, 48.

Eutyphis ovoides Claus, 1879a, p. 155 (9).

Eutyphis globosus Claus, 1879a, p. 159 (12).

Eutyphis ovoides Claus, 1887, p. 35, pl. 1, pl. 2, figs. 1, 2; pl. 3, figs. 1-3.

Eutyphis globosus Claus, 1887, p. 38, pl. 3, figs. 4, 15-19.

Thirteen specimens were taken from the surface to 800 fathoms.

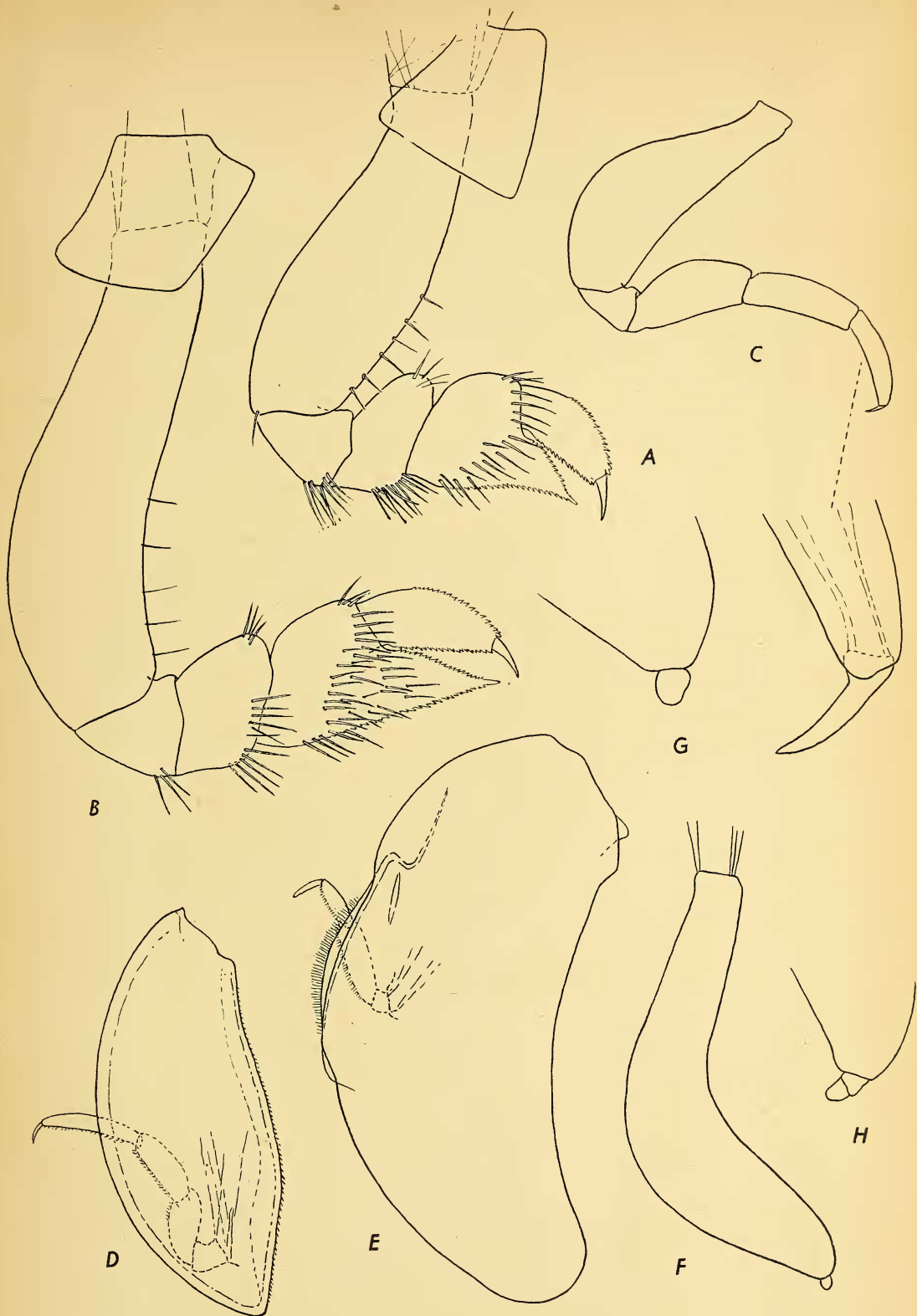
Distribution.—North and South Atlantic; Mediterranean; North Pacific; South Pacific (*intermedius*); Indian Ocean. The present records are the first for the western North Atlantic.

Platyscelus ovoides reaches a length of 20 mm. The present collection contains both male and female specimens measuring from 5-17 mm. All but the three smallest speci-

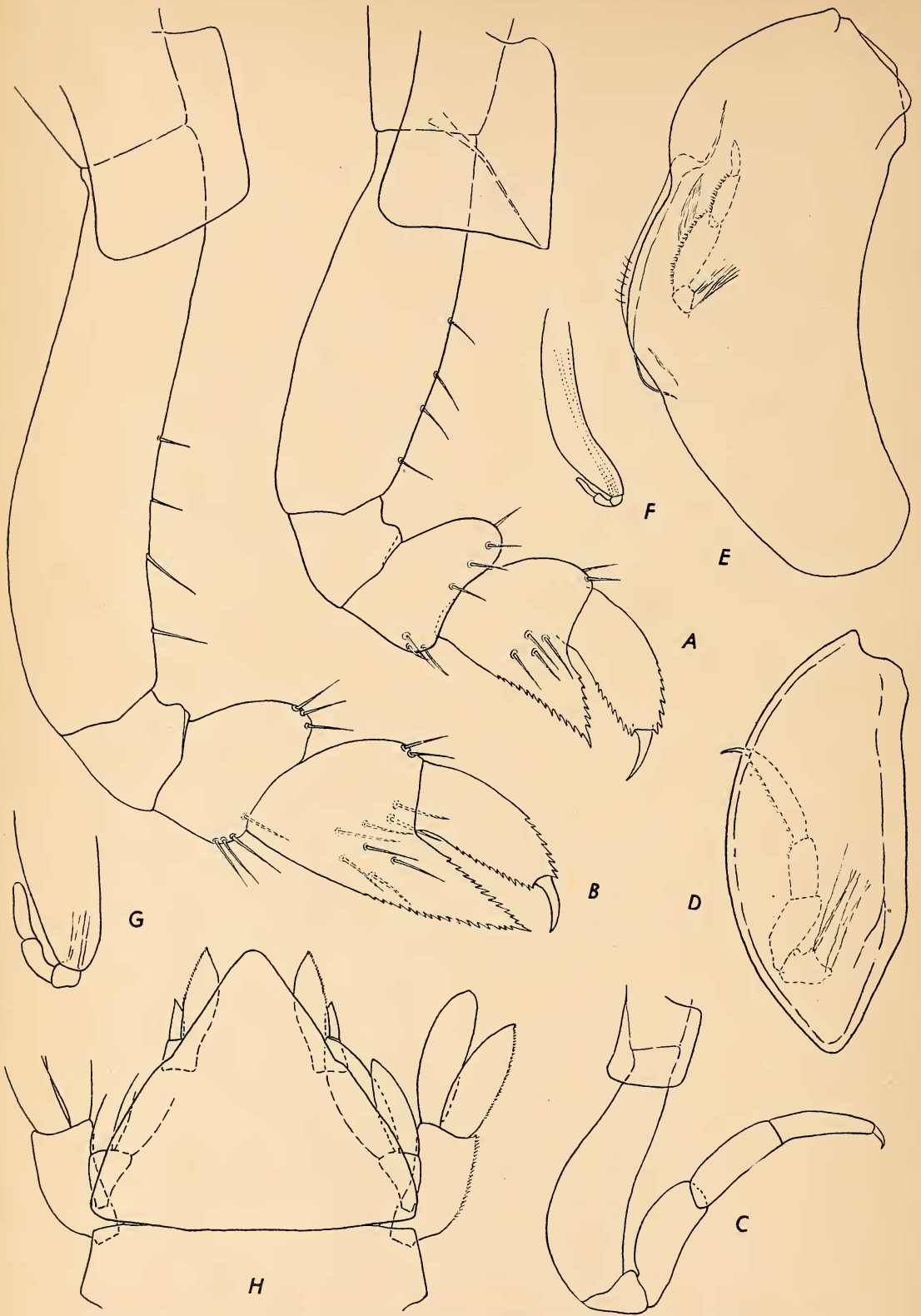
mens, measuring 5-7 mm., are typical *P. ovoides*. These three smallest specimens appear to be what Claus described and figured as *P. globosus*, which undoubtedly is only the small immature stage of *P. ovoides*. The fifth pereopod (seventh of Claus) in *ovoides* is reduced to a narrow curved second joint bearing apically a very small atrophied joint. The fifth pereopod in *globosus* is represented by Claus as having a narrow curved second joint bearing apically three short degenerate joints. I have figured the gnathopods and pereopods of both *ovoides* and *globosus* in order to show that the slight differences existing between them can be readily accounted for by the differences in size and maturity. The female of *ovoides* I have figured is 12 mm. in length and the specimen of *globosus* is 5 mm. In *ovoides* the serrations on the fifth and sixth joints of the first and second gnathopods are more numerous; in the third pereopod the serrations extend from the distal portion of the fourth joint to the sixth joint; in the fourth pereopod the second joint is a little narrower distally and the fringe of setae on the hind margin is much denser.

The female of *ovoides* I have figured carries young, which agree with the young specimen figured by Claus (1887, pl. 2, fig. 1). As will be seen from his figure, the pereopods all possess seven joints and are quite normal in appearance. As the animal grows, a considerable change takes place in the pereopods, but the greatest alteration occurs in the third, fourth and fifth pairs. The second joint of the third and fourth pereopods become greatly enlarged and the succeeding joints become greatly reduced, moving from their apical position to the inner surface of the joint. In the fourth pereopod the alterations are greater than in the third, the third to sixth joints undergoing greater reduction and the seventh joint becoming lost. The fifth pereopod suffers the greatest change, becoming finally a short, narrow lamellar appendage bearing a very small apical knob-like third joint. In this pereopod the terminal joints appear to be lost gradually. The very young possess the normal number of seven. Specimens 5-7 mm. possess a comparatively long narrow second joint and three succeeding reduced and useless joints, the sixth and seventh having been lost. The next largest specimen in the collection, a male measuring about 8.5 mm., has lost the fifth, sixth and seventh joints, leaving only the very greatly reduced third and fourth joints forming a knob-like appendage to the second. Larger specimens possess only a single-jointed knob-like appendage to the second joint.

These facts, in conjunction with the great similarity in the other characters of *ovoides* and *globosus*, leave no doubt that they are



TEXT-FIG. 47. *Platyscelus ovoides* (Claus), female 12 mm. in length. **A**, gnathopod 1; **B**, gnathopod 2; **C**, pereopod 1; **D**, pereopod 3; **E**, pereopod 4; **F**, pereopod 5; **G**, end of pereopod 5 greatly enlarged; **H**, end of pereopod 5 of a male 8.5 mm. in length.



TEXT-FIG. 48. *Platyscelus ovoides* (Claus), immature specimen 5 mm. in length. **A**, gnathopod 1; **B**, gnathopod 2; **C**, pereopod 1; **D**, pereopod 3; **E**, pereopod 4; **F**, pereopod 5; **G**, end of pereopod 5 enlarged; **H**, uropods and telson. (The young of this species was described by Claus as *Eutyphis globosus*.)

synonymous. Comparatively few specimens of *globosus* have been recorded, probably for the reason that they have been identified as the young of *ovoides*. The *Thor* took 53 specimens of *globosus* measuring from 5-7 mm. in the Mediterranean, and one in the Atlantic near by. Dr. Stephensen presumed that they were all females, but the specimens were undoubtedly the young of *ovoides* which were too immature to be sexually determined. Claus gives the sexes of *ovoides* but does not mention the sex of *globosus*, evidently for the reason that his specimen was immature and the sex could not be determined.

The uropods and telson are the same in both *ovoides* and *globosus* except that the rami are somewhat narrower in *globosus*, as they likewise are in *Platyscelus*, sp. jun. Stephensen (1925, fig. 84, Us-T). These specimens, *Platyscelus*, sp. jun., measuring 2.5 mm., from the Mediterranean, are undoubtedly the very young of *P. ovoides*, which still possess the seven joints to the fifth peraeopod (1925, fig. 84, p. 7).

The species, *P. intermedius*, described by Thomson from New Zealand in 1879 is probably the same as *P. ovoides* Claus, but the species was not figured and the description is not sufficient for the determination of the species.

***Platyscelus serratulus* Stebbing.**

Eutyphis serratus Claus, 1879a, p. 157 (11).

Eutyphis serratus Claus, 1887, p. 37, pl. 3, figs. 5-14.

Platyscelus serratulus Stebbing, 1888, p. 1470.

Platyscelus serratulus Chevreux and Fage, 1925, p. 422, fig. 414.

Platyscelus dubius Shoemaker, 1925, p. 51, figs. 20, 21.

One specimen was taken at a depth of 800 fathoms.

Distribution.—North Atlantic; South Atlantic; North Pacific (*dubius*); South Pacific; Indian Ocean; Red Sea; Mediterranean. The present records are the first for Bermuda.

Platyscelus serratulus reaches a length of 6 mm. The single specimen, a male, taken at Bermuda is about 5 mm. in length.

***Amphithyrus bispinosus* Claus.**

Amphithyrus bispinosus Claus, 1879a, p. 161 (15).

Amphithyrus bispinosus Claus, 1887, p. 41, pl. 6, figs. 4-16.

One specimen was taken at a depth of 300 fathoms.

Distribution.—North and tropical Atlantic; Mediterranean; East Indies; New Zealand; Arabian Sea; Bay of Bengal; Hong-kong-Shanghai (Stephensen). It is new to the Bermuda area.

This is a small species measuring about 3 mm.

***Amphithyrus similis* Claus.**

Amphithyrus similis Claus, 1879a, p. 162 (16).

Amphithyrus similis Claus, 1887, p. 42, pl. 7, figs. 10-12.

Five specimens were taken at depths between 100 and 1,000 fathoms.

Distribution.—North Atlantic; Mediterranean; Red Sea. The present records are the first for the western North Atlantic.

This species measures about 3 mm. in length, which is the size of the largest specimens in the Bermuda material.

***Tetrathyrus forcipatus* Claus.**

Tetrathyrus forcipatus Claus, 1879a, p. 160 (14).

Tetrathyrus forcipatus Claus, 1887, p. 40, pl. 5, figs. 10-13, pl. 6, figs. 1-3.

Tetrathyrus sancti-josephi Shoemaker, 1925, p. 54, figs. 22-24.

Tetrathyrus forcipatus Chevreux and Fage, 1925, p. 422, fig. 415.

Two specimens were taken at depths of 25 and 800 fathoms.

Distribution.—North, tropical and South Atlantic; Mediterranean; Red Sea; Northern Arabian Sea; East Indies; New Zealand; and North Pacific (California, *T. sancti-josephi*). It is new to the Bermuda region.

This species measures from 3 to 4.5 mm.

***Hemityphis rapax* (Milne-Edwards).**

Typhis rapax Milne Edwards, 1830, p. 395.

Typhis rapax Milne Edwards, 1840, p. 97.

Dithyrus tenuimanus and *crustulum* Bovalius, 1887c, p. 46.

Schizoscelus rapax Bovallius, 1887c, p. 44.

Hemityphis tenuimanus Claus, 1887, p. 38, pl. 4, figs. 1-13.

Hemityphis crustulatus Claus, 1887, p. 39, pl. 4, figs. 14-22.

Hemityphis rapax Pirlot, 1930, p. 37 (literature).

One specimen was taken at a depth of 50 fathoms.

Distribution.—North and South Atlantic; Mediterranean; New Zealand; East Indies; Indian Ocean; Arabian Sea. It has not heretofore been recorded from the western North Atlantic.

Hemityphis rapax is a small species measuring about 5 mm. in length. The single specimen of the present collection, which is a male, is about 4.5 mm.

***Paratyphis maculatus* Claus.**

Paratyphis maculatus Claus, 1879a, p. 160 (14).

Paratyphis maculatus Claus, 1887, p. 39, pl. 5, figs. 1-9.

?*Paratyphis parvus* Claus, 1887, p. 40.

Two male specimens were taken at depths of 400 and 600 fathoms.

Distribution.—North and South Atlantic; East Indies; Gulf of Aden. It is new to the Bermuda region.

This species ranges from 2 to 4 mm. in length. The specimens from Bermuda (both males) are about 3.5 mm.

These two males agree with Claus's figures (1887, pl. 5, figs. 1-9) and bear the five brownish-red spots on the side of the metasome. It appears that several of the subsequent species of *Paratyphis* are distinguished by very flimsy character modifications and no doubt sooner or later will be made synonyms of *maculatus*, in which category *parvus* has already been doubtfully placed. In some of the genera of hyperiids remarkable modifications have taken place both in the body and appendages. Under such circumstances it is perhaps not to be expected that the same appendage of every individual of a species should undergo precisely the same amount of modification. Some authors have been inclined to regard slight differences in a character as of too great significance, and in some instances species have been founded on such slight modifications. Such discrepancies should, by all means, be noted, but it would seem advisable to place such specimens in the species with which they so nearly agree, if, by a slight stretch of the imagination, this could be done. This would tend to lessen the existing confusion in some of the genera and would curtail the mounting list of synonyms.

FAMILY THYROPIDAE.

Parascelus edwardsii Claus.

Parascelus edwardsii Claus, 1879a, p. 164 (18).

Parascelus edwardsii Claus, 1887, p. 46, pl. 10, figs. 1-11.

Parascelus zebu Stebbing, 1888, p. 1496, pl. 185.

Two specimens were taken, one at the surface and one at 100 fathoms.

Distribution.—North Atlantic; tropical Atlantic; Mediterranean; Red Sea; East Indies; South Pacific; North Pacific. The present specimens are the first taken in the western part of the North Atlantic.

The male and female recorded by Barnard from the South Pacific measured 6 and 5 mm. respectively. The specimens recorded by Stephensen from the Mediterranean and Atlantic measured from 3 to 6 mm. Those which I have recorded from Bermuda are about 4 mm.

Parascelus typhoides Claus.

Parascelus typhoides Claus, 1879a, p. 165 (19).

Parascelus typhoides Claus, 1887, p. 46, pl. 9, figs. 12-16, pl. 10, figs. 12-13.

One specimen was taken at a depth of 600 fathoms.

Distribution.—North and South Atlantic; Mediterranean; Red Sea. It is new to the western North Atlantic.

The single specimen (a female) taken by the *Thor* measured 6.5 mm. (Stephensen). The ovigerous female recorded by Barnard measured 5 mm. The Bermuda specimen, a male, is about 3.5 mm.

Thyropus sphaeroma (Claus).

Tanyscelus sphaeroma Claus, 1879a, p. 163 (17).

Tanyscelus sphaeroma Claus, 1887, p. 45, pl. 8, figs. 1-11.

Thyropus sphaeroma Bovallius, 1887c, p. 43.

Thyropus danae Stebbing, 1888, p. 1492, pl. 210C.

Thyropus sphaeroma Spandl, 1927, p. 259, figs. 53, 54; p. 284, fig. 63.

One specimen was taken at a depth of 300 fathoms.

Distribution.—North Atlantic; South Atlantic (36° S., 51° W., Barnard); East Indies; Indian Ocean; Northern Arabian Sea. The present record is the first from the western North Atlantic. Barnard has recorded males measuring 7 mm. in length. The Bermuda specimen, a female, is about 6 mm.

Thyropus diaphanus, the genotype, described by Dana from the tropical Atlantic (4° S., 21° W.), differs from *T. sphaeroma* principally in the third uropods, the rami of which he says are subequal, and are so shown by his figures. He gives the length as one-quarter inch, which is a little over 6 mm. It is possible that Dana's observation on this character may not be correct, and that *diaphanus* and *sphaeroma* may be synonymous.

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